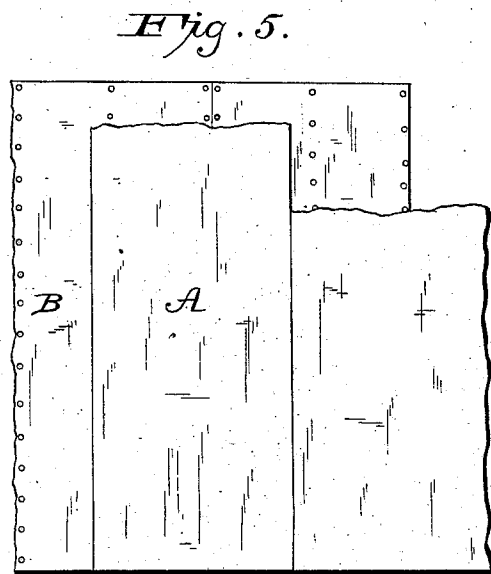
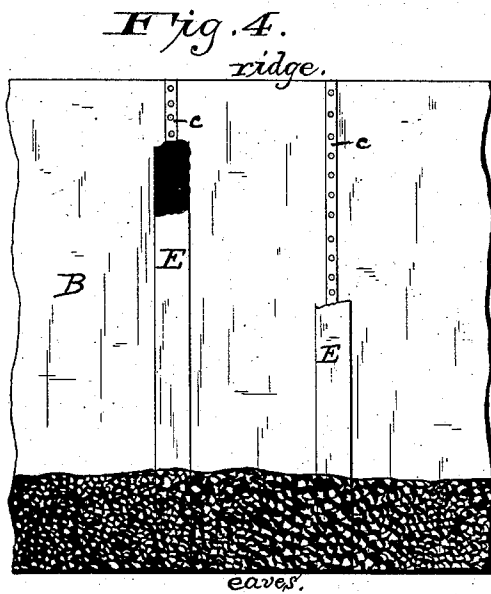
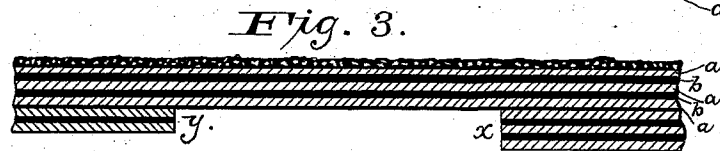
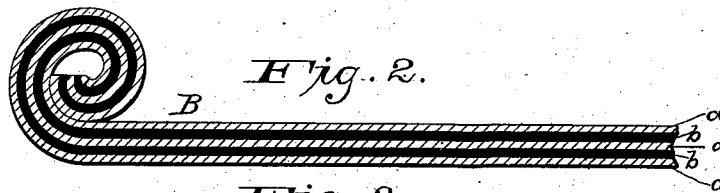
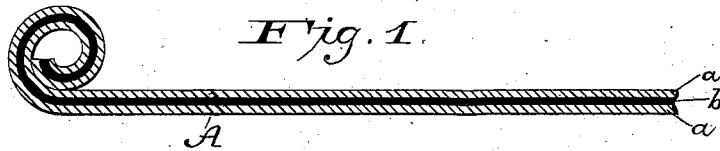


(No Model.)

W. H. H. CHILDS.
FELT AND GRAVEL ROOF.

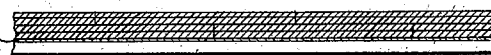
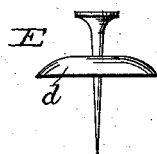
No. 294,579.

Patented Mar. 4, 1884.



Witnesses:
E. M. Durbin
W. S. Simsbach

Fig. 6.



Inventor:

W. H. H. Childs
Per E. M. Durbin

Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM HENRY HARRISON CHILDS, OF BROOKLYN, NEW YORK.

FELT AND GRAVEL ROOF.

SPECIFICATION forming part of Letters Patent No. 294,579, dated March 4, 1884.

Application filed January 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. CHILDS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Felt and Gravel Roofs, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in the construction of felt and gravel roofs.

The object of my invention is to produce a roof which will be more easily and quickly laid and at the same time be more uniform and perfect in its construction; and to this end my invention consists in using as the foundation of the gravel roof a manufactured material, consisting of two, three, or more plies of felt or other fabric saturated with coal-tar, pitch, asphaltum, or other water-proof material, the plies of felt or other material thus coated and saturated being joined together by layers of coal-tar, pitch, or bituminous compounds placed between them in the process of manufacturing the same.

My invention consists, further, in certain details of construction, which will be more fully described, and pointed out in the claims.

Figure 1 is a longitudinal sectional view of a two-ply felt. Fig. 2 is a similar view of a three-ply felt. Fig. 3 is a sectional view of a three-ply felt with a layer of gravel thereon. Fig. 4 is a top or plan view of one form of laying my improved roof. Fig. 5 is a top and edge view of another form. Fig. 6 is a side view and also a top view of a nail of peculiar construction used for securing the plies of felt to the boards of the roof.

In the construction of felt and gravel roofs, it has heretofore been the practice to lay single layers of felt or tarred paper on the sheathing-boards of the roof shingle-fashion, one layer at a time, and as each layer was laid to mop it between the overlapping edges with hot pitch; then another layer of felt or tarred paper applied in the manner above described, and so on until the desired number of layers of felt have been laid. It is a difficult matter to lay a perfect roof in this manner, unless it is done by skillful workmen having perfect appliances and under favorable conditions of

weather. If the weather is cold, the coal-tar, pitch, or other bitumen used in cementing the edges of the felt together is apt to set or become hard, and thus the layers are imperfectly joined. If the weather is hot, the bitumen is apt to run toward the eaves of the roof, and thus be unequally distributed, rendering the bond between the overlapping layers of felt imperfect. Should high winds prevail, much difficulty is experienced in handling these single sheets of felt or paper, and it is almost impossible to get them laid in their proper position without being torn or destroyed by the wind.

To overcome these obstacles and provide a means for laying a good roof under any and all circumstances is the object of my present invention, which I will now proceed to describe.

In the drawings, A designates a two-ply, and B a three-ply fabric composed of layers of paper or felt, *a*, saturated with coal-tar, pitch, or bitumen, and joined together by layers of coal-tar, pitch, or any suitable bituminous cement, *b*. Any of the two or three ply felt manufactured under the patents granted A. Robinson, with proper machinery and under favorable circumstances, will be found to produce good results when laid according to my invention.

In the covering of a roof I use as many layers of the two or three ply fabric as may be desirable. For example, two layers of the two-ply fabric laid upon the roof makes a foundation of four plies of water-proof fabric with two layers of bitumen, coal-tar, or coal-tar pitch over the entire surface of the roof. Two layers of the three-ply felt will make a foundation of six plies of fabric and four layers of the bitumen, as shown at *x*, Fig. 3. A layer of the three-ply and a layer of the two-ply will make a foundation of five plies with three layers of the bituminous cement, as shown at *y* in Fig. 3.

I have shown in the lower part of Fig. 5 a sectional view of a roof in which two layers of two-ply felt are used.

C are the roof-boards, on which is placed a layer or sheathing of untarred paper, D, which will prevent the foundation felt or fabric from adhering to the roof-boards, so that any shrinking or swelling of the roof-boards will not in-

jure or cause cracks in the roof. On top of the sheathing D is laid one, two, or more layers of the two or three ply felt.

My preferred manner of laying is shown in Fig. 4, in which the manufactured felt is laid from eaves to ridge and lapped two inches at the edges. The laps are fastened by nails and disks—such as are shown in Fig. 6—or by nailing over the lap a strip of wood one inch wide and one-fourth ($\frac{1}{4}$) inch thick, as shown at *ee*. The lap is then covered with hot pitch or composition, and upon and embedded in this, while it is still hot, is a cap of felt, E, from four to five inches wide. Over the foundation thus laid is spread a heavy layer of coal-tar, pitch, or other suitable bituminous matter, in which is embedded a thick layer of clean gravel.

In the upper portion of Fig. 5 I have shown another method of laying the foundation where two thicknesses of felt are used. In this case the layers of felt are laid from eaves to ridge, the upper layer being laid to break joints with the lower layer, both layers being secured in position and covered with coal-tar or pitch and gravel, as hereinbefore stated.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A roof composed of a sheathing or layer of untarred paper laid on the roof-boards, one or more layers of manufactured felt, substantially such as described, superposed on the sheathing of untarred paper, a layer of bituminous cement, and a layer of gravel embedded therein, as set forth.

2. A roof composed of one or more layers of a manufactured felt, substantially such as described, having the adjoining or overlapping edges secured or joined together by strips of wood or metal disks being nailed down over them, a layer of pitch and a strip of felt or paper secured over the wooden strips, and superposed layers of pitch and gravel, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM HENRY HARRISON CHILDS.

Witnesses:

C. E. LOCKWOOD,
EVERSLEY CHILDS.