No. 798,131. PATENTED AUG. 29, 1905.

F. W. GEZELSCHAP & A. WINDING.

COMPOSITE ROOFING.

APPLICATION FILED FEB. 17, 1905.

Fig. 1.

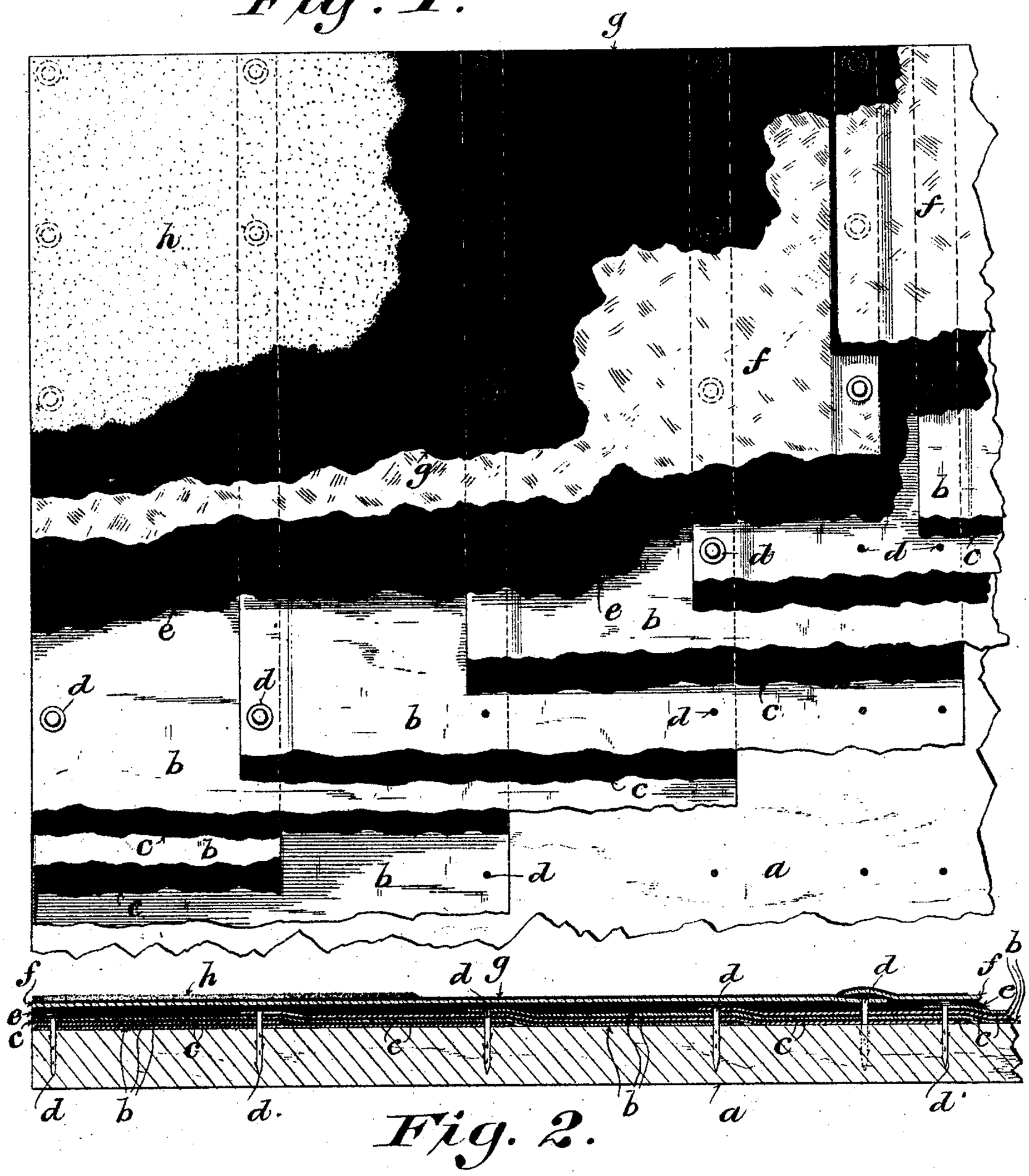

Fig. 2.

Witnesses:
Geo. W. Young.
Chas. L. Goss.

Inventors:
Friedrich W. Gezelschap,
Arthur Winding
By Kinkle, Flanders, Smith & Bothwell
Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK W. GEZELSCHAP AND ARTHUR WINDING, OF MILWAUKEE, WISCONSIN.

COMPOSITE ROOFING.

No. 798,131. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed February 17, 1905. Serial No. 245,990.

To all whom it may concern:

Be it known that we, FREDERICK W. GEZELSCHAP and ARTHUR WINDING, citizens of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Composite Roofing, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates more particularly to composite roofings which are built up as they are laid in a continuous structure as distinguished from ready-made roofings which are prepared before they are laid and which when laid have distinct joints between the component sections.

The main objects are to produce a strong, durable, comparatively light water and practically fire proof composite roofing that can be easily laid to conform to varying conditions and when laid will not creep, buckle, or crack, and generally to improve the construction and facilitate laying roofing of this class.

It consists in certain novel features of construction and in the peculiar arrangement of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings, like letters designate the same parts in both figures.

Figure 1 is a fragmentary plan view of a piece of roofing constructed in accordance with the invention, parts of the overlying layers being broken away to disclose underlying layers and more clearly illustrate the method of building up the roofing; and Fig. 2 is a vertical section on the line 2 2, Fig. 1.

Ready-made roofings of this class are usually rolled while they are warm and pliable and are often kept in this form for some time before they are used. As they become dry and hard they set in the form in which they are rolled, so that it is difficult, if not impossible, when they are used to spread them flat or make them conform to the surfaces on which they are laid. In unrolling and spreading them they crack and assume a more or less wavy form, so that it is difficult to produce tight joints between the separate sheets. In this wavy form or condition the roofing when laid has a greater tendency to slide or creep on its foundation and to break or weaken the fastenings by which it is secured thereto, and since it does not lie flat upon and in contact at all points with the surface on which it is laid walking upon the roofing is much more apt to crack and injure it. With the necessarily thick stiff sheets into which such roofing is primarily formed it is impossible or difficult not only to make and maintain good permanent joints between the different sheets or sections, but also to readily and snugly fit the sheets over and around angles and projections, such as chimneys, towers, and the like. All these objections to ready-made roofing of this character are overcome by our improved composite roofing, which is built up from its constituent parts as it is laid and is thus readily made to conform to the surfaces on which it is laid and to angles and projections, while broken lapped joints are made between the several component layers, and thus distributed through the roofing instead of being made between thick stiff composite sheets and extending at intervals through the entire body, as in the case of the ready-made roofing.

Referring to the accompanying drawings, which illustrate the preferred construction and mode of laying our roofing, *a* designates the board or other foundation on which the roofing is laid. Directly on this foundation one or more, preferably a number, of layers *b b* of tough fibrous felt, such as the so-called "wool felt," are spread, the separate sheets being laid so as to make regular lapped and broken joints. These sheets of felt are saturated with a substance such as asphaltum, coal-tar, or roofing composition containing one or both of these ingredients. This not only binds the fiber of the felt together, making it more durable, but also renders it impervious to air and moisture. The lapping surfaces of the successive sheets are coated and cemented together, as shown at *c c*, with a pitchy or waterproof substance, like or similar in nature or composition to that with which the sheets are saturated. The several layers are secured to the roofing-boards or other foundation by nails *d d*, having large flat heads or caps along the overlapping edges of the several sheets. A coat *e*, of pitch or waterproof material like that used for saturating the wool-felt sheets and cementing them together, is flowed or spread over the entire surface of the upper layer of wool felt, and while it is hot or in a semifluid or plastic condition a layer *f* of pure asbestos felt is embedded therein and cemented thereby at all points to

the top layer of the underlying wool felt. The sheets of which this layer of asbestos felt is composed are lapped and break joints with the upper layer of wool felt. This layer of asbestos covers and protects the underlying coat of pitch or waterproof substance, which would soon evaporate and disappear if exposed to the weather, and also protects the saturated layers of wool felt, which would rot and disintegrate if they were exposed to the sun and to rain and moisture. It also prevents the pitch or waterproof coating from flowing or creeping in hot weather, particularly when the roof is laid on an inclined surface. To prevent this cap sheet or layer of asbestos felt from washing or wearing away, a coating *g*, of pitch or waterproof composition like or similar to that employed in the substructure of the roofing, is applied thereto in a thin or fluid condition, so that it will penetrate the asbestos and stick its fibers or particles together, thereby making it firm and durable. Upon this last coating of pitch or waterproof material while it is in a fluid or plastic condition a final coating *h*, of sand or fine gravel, is preferably spread to afford additional protection to the layer of asbestos felt, which makes the roofing practically fireproof, besides materially increasing its durability. This protecting sheet or layer of asbestos saturated with pitch or some similar binding substance, whether coated with sand or gravel or not, completely covering and effectively sealing the underlying parts of the roofing against exposure to the sun and to rain and moisture on the outside, will not rot or disintegrate, like wool felt or other destructible material, when exposed to the weather and will not wash away, like sand or gravel. A very durable as well as a light and easily-constructed water and fire proof roofing is thus produced.

In practice the coating *e* is spread on the top layer or surface of the wool felt *b* in successive strips corresponding approximately in width with the sheets of asbestos felt *f*, which are laid one after another on said strips and embedded in the pitch or like material while it is hot and fluid or plastic, each successive strip of the coating being spread over one edge of the preceding sheet of asbestos, so that the overlapping edge of the next sheet will be stuck thereto and form a water-tight joint therewith. The underlying edge of each asbestos sheet before the coating of pitch is applied thereto is nailed to the board or other foundation *a*, so that the heads or caps of the nails *d* will be covered by the overlying edge of the adjoining sheet. Thus when the roof is completed the nail heads or caps are all covered and protected against moisture and rust. The nails also being driven through several layers of pitch while it is soft and plastic are coated therewith, and thus sealed and protected against moisture and rust.

Two or more layers of asbestos felt may be used in place of the single layer above the wool felt, and to make the roofing fireproof on the under as well as the upper side one or more layers of like material may be laid below the wool felt next to the board or other foundation *a*.

In the construction of the roofing more or less layers of wool felt may be used, and their lapping surfaces may be coated and cemented together to a greater or lesser extent, as desired.

Various waterproof binding and preservative substances or compositions may be employed for saturating and coating the constituent layers of the roofing; but a substance or composition of like homogeneous nature is preferably employed throughout the entire structure in order to insure uniform expansion and contraction under varying conditions of temperature and humidity, and thus prevent breaking and cracking of the roofing.

Various changes in the minor details of construction and in the arrangement of the component parts of the roofing may be made without departing from the principle and intended scope of the invention.

We claim—

1. A composite roof consisting of lapped sheets of tough fibrous felt cemented together at the laps with waterproof material and covered with a coating of volatile, combustible and waterproof material, and a covering layer of asbestos felt embedded in said coating and cemented thereby to the underlying felt, substantially as described.

2. A composite roof consisting of a number of layers of tough fibrous felt, laid with lapped and broken joints, the laps being cemented together with waterproof material and the top layer being covered with a coating of volatile, combustible and waterproof material, and a layer of asbestos felt embedded in said coating and cemented thereby to the underlying layer of felt, substantially as described.

3. A composite roof consisting of a number of layers of tough fibrous felt laid with lapped and broken joints cemented together and covered with a coating of volatile, combustible and waterproof material, and a layer of asbestos felt embedded in said coating and saturated with waterproof and binding material, substantially as described.

4. A composite roof consisting of layers of tough fibrous felt saturated with a preservative waterproof material and laid with lapped and broken joints which are cemented with waterproof material, a heavy coating of volatile, combustible and waterproof material covering the top layer of said felt and a layer of asbestos felt embedded in said coating and saturated with waterproof and binding material, substantially as described.

5. A composite roof consisting of layers of wool felt saturated with preservative material

and laid with lapped and broken joints which are cemented with waterproof material and fastened to the roof-foundation by capped nails, a heavy coating of volatile, combustible and waterproof material covering the top layer of said wool felt and the nail-caps, and a layer of asbestos felt embedded in said coating and saturated with waterproof and binding material, substantially as described.

6. A composite roof consisting of layers of tough fibrous roofing-felt saturated with pitch and laid with lapped and broken joints which are cemented with pitch and nailed, a thick coating of pitch covering the top layer of felt and the nail heads or caps, a layer of asbestos felt embedded in said coating and cemented thereby to the top layer of felt, a binding-coat of pitch covering and penetrating said asbestos felt, and a top coating of sand or gravel, substantially as described.

In witness whereof we hereto affix our signatures in presence of two witnesses.

FREDERICK W. GEZELSCHAP.
ARTHUR WINDING.

Witnesses:
CHAS. L. GOSS,
ZAYDA G. DALTON.