

(No Model.)

G. S. LEE.
ROOFING.

No. 453,979.

Patented June 9, 1891.

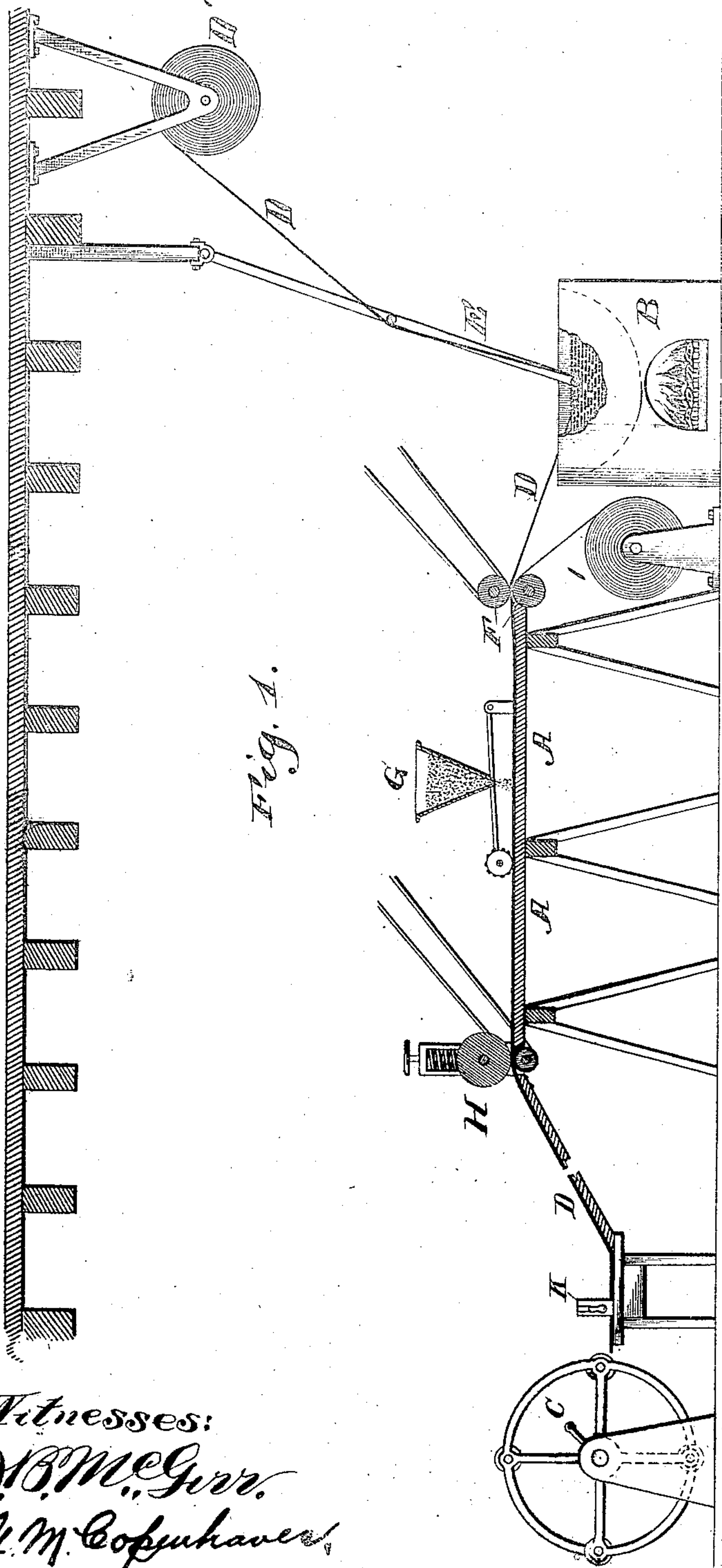
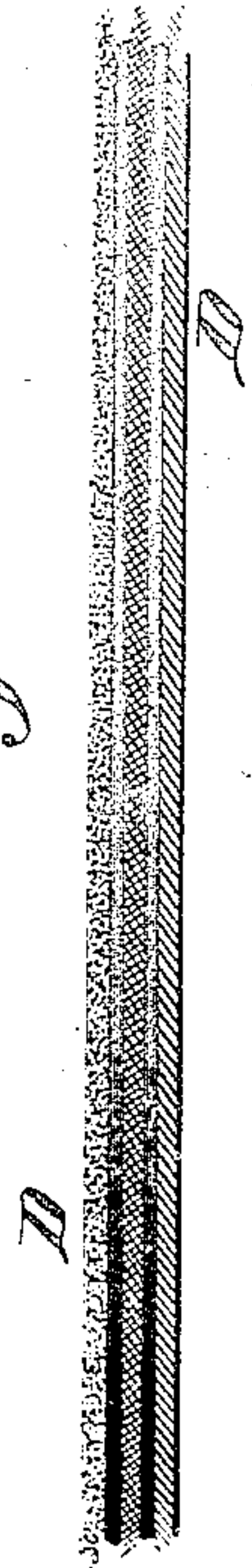


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE S. LEE, OF DENVER, COLORADO.

ROOFING.

SPECIFICATION forming part of Letters Patent No. 453,979, dated June 9, 1891.

Application filed May 14, 1890. Serial No. 351,723. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE S. LEE, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Roofing; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to that class of roofing material in which a sheet, strip, or web of cloth, felt, jute, paper, or two or more sheets, webs, or strips of one or different materials constitute a backing to receive and hold an asphaltic or other suitable plastic composition, upon which is spread and in which composition is embedded a granular surface, covering, or coating adapted and designed to serve as a tread or wearing surface as well as a protective facing.

The object of the present invention is to produce a novel style or form of roofing material having the above-named characteristics, but which will be superior in point of durability, safety, and general adaptability to the purposes for which such material as roofing-sheets are intended than any roofing heretofore in use. In the manufacture heretofore of roofing material of the class to which this invention belongs it has been customary to employ various kinds of backing, such as paper, cloth, and the like, and to coat or saturate the same with tar or asphaltum compounds, serving to hold and retain the granular surfacing material. The surfacing or facing material commonly employed has been silicious sand or fine gravel; but it has been proposed to employ the slag from iron furnaces. I have discovered, however, that a very superior surface or facing may be produced by the use of the peculiar quality of slag which results from the reduction of gold, silver, copper, and lead ores, the same being specially adapted for roofing purposes, as well as for floor-coverings, stair-pads, wall-linings, and the various other applications to which a flexible, portable, durable, and non-conducting web or sheet is generally adapted.

My invention accordingly consists, broadly, in the production, as a new article of manufacture, of a roofing sheet, web, or strip com-

prising a backing of any suitable material saturated with an asphaltic composition and a surface coating of granular slag or refuse from gold, silver, copper, or lead reduction works. The slag which I employ for this purpose is known at smelting and reduction works as "iron slag," from the large percentage of iron which it contains, and is an entirely and essentially different kind of material from the ordinary slag produced from the reduction of iron ores. Such iron slag usually contains from thirty-three to fifty per cent. of iron, combined in various proportions with silica, lime, alumina, magnesia, and a trace of gold, silver, or other metal of which it is the refuse. It is a material of almost steel-like hardness, somewhat metallic in appearance, and is characterized by a spongy or porous texture, for which reason, as well as for others, it is peculiarly fitted and adapted to be mechanically combined with a plastic composition, such as asphaltum, which enters the pores of the slag and causes a firm adhesion, which resists to an extraordinary degree wear and abrasion. Water, which is contained in all rock, gravel, sand, and other materials heretofore employed, and which operates against the perfect combination of asphalt, is entirely absent from the iron slag, and hence this material has a peculiar affinity for asphaltic compounds, and absorbs the same into its pores while it repels water or moisture.

In the production or manufacture of the roofing I use as a backing or web for the reception of and impregnation with the liquid asphaltum or asphaltic composition any suitable material, such as cotton or linen duck, drilling, muslin, felt, or any other fibrous or textile material, or even absorbent paper if the same be found appropriate, and after thoroughly saturating the same with the asphaltic composition I attach it to a backing of heavy paper by pressure between rolls, and then pass the web under a hopper containing granulated slag, with the cloth side uppermost, and discharge the slag upon the still liquid or semi-liquid asphaltic coating, to which the slag adheres and in which it becomes embedded and incorporated. The roofing is then fed along upon a table, upon which are mounted at suitable intervals pressure-rolls, which press the granular slag into the

asphalt. The surplus is removed by brushing or scraping and the material finally wound upon a reel or upon rolls and cut into suitable lengths for sale, transportation, and convenient use.

The apparatus employed in the manufacture of the roofing is simple but effective in its structure and operation, and in this connection does not require specific description. A fuller explanation will be given in another application to be filed hereinafter.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of an apparatus for the production of the roofing. Fig. 2 is a sectional view of a piece or sheet of the roofing exaggerated in thickness to show clearly the relation of the constituent parts.

The apparatus comprises a long table A, at one end of which is located a tank B to hold the liquid asphaltic compound, and which is provided with suitable heating appliances. At the other end of the table is located a reeling apparatus C, provided with a number of detachable rolls, which are brought successively into requisition to receive the roofing as it comes from the table. The webbing or cloth D is fed from a roll D', situated above and back of the tank B, and is carried down into the tank, passing under a metallic frame E, which holds it pressed down in the liquid, from which it emerges toward a pair of rollers F. A reel of paper is situated between the tank and the table, and as the cloth emerges from the tank it meets the paper and both pass together between the rollers F, which press the two into intimate contact and secure them together, the cloth uppermost. The compound backing is then fed automatically under a hopper G, containing the granulated slag, which now falls in a stream the whole width of the backing upon the saturated cloth, covering the same to a suitable depth to insure a full supply. As the roofing still travels lengthwise of the table, the surplus slag is brushed away and the roofing passes between pressure-rolls H, which compress the slag deeply into the asphalt. The roofing

then continues its course toward the reel, the table being long enough to give the material time to cool and harden before being rolled up. A knife or shears K is located at the end of the table, and as each roll is filled the web is cut off and a chalk-mark made at a distance of, say, forty feet from the knife. A new reel is brought forward, the end of the web attached thereto, and the operation continued. As will be seen, the operation of making the roofing is continuous and automatic. So long as the materials last the machine will continue to produce roofing and its production will be many thousand feet per day.

The asphaltic composition which I employ consists of any good quality of rock asphaltum dissolved under heat in admixture or combination with crude petroleum or petroleum refuse. To give the compound body, when required, other ingredients may be mixed therewith in any desired proportions, such as talc, red oxide of iron, cement, &c.; but the petroleum refuse and the asphaltum are the only materials really required.

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

1. As a new article of manufacture, roofing consisting of a backing, sheet, or web coated or saturated with an asphaltic composition and surfaced with granulated refuse from gold, silver, lead, or copper reduction works, substantially as described.

2. As a new article of manufacture, roofing, &c., consisting of cloth or like material saturated with asphaltic composition, having a backing of paper and a surface of granulated refuse from gold, copper, silver, or lead reduction works, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of April, 1890.

GEORGE S. LEE.

Witnesses:

GEORGE E. MATHEWS,
A. E. HUNTER.