

Jan. 29, 1929.

1,700,561

F. J. COMMINS ET AL

ROOFING AND OTHER SHEET AND PROCESS FOR MAKING SAME

Filed July 6, 1925

2 Sheets-Sheet 1

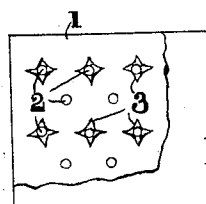
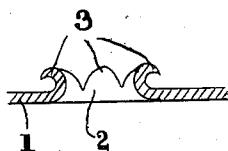
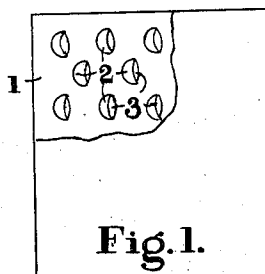
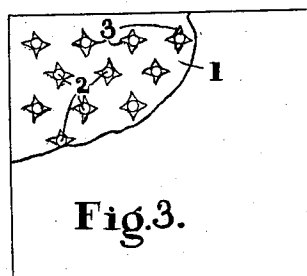
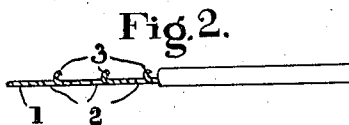
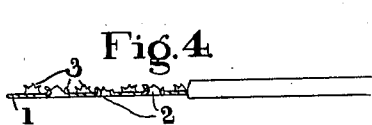


Fig. 6.

Fig. 5.

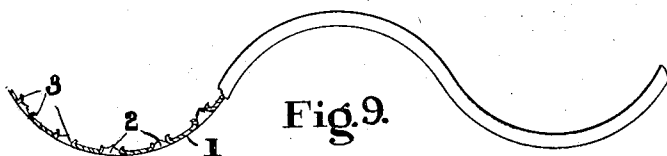


Fig. 9.

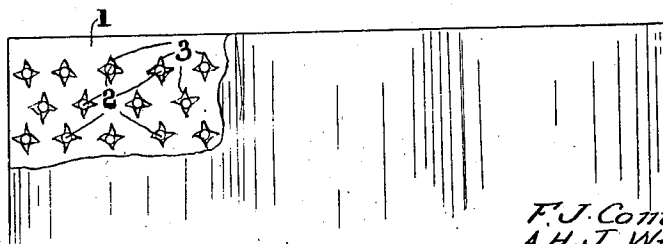


Fig. 8.

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ROOFING AND OTHER SHEET AND PROCESS FOR MAKING SAME

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2 Sheets-Sheet 2

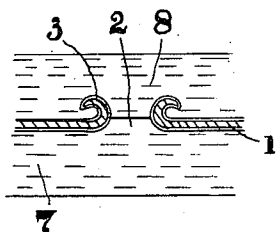


Fig. 10

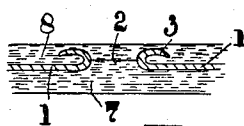


Fig. 11

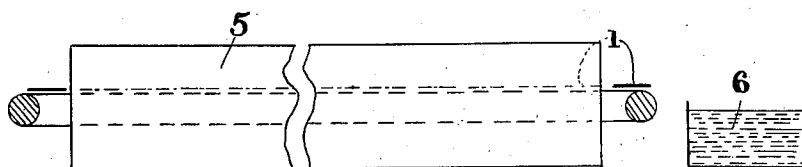


Fig. 12

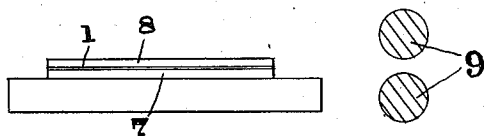


Fig. 13

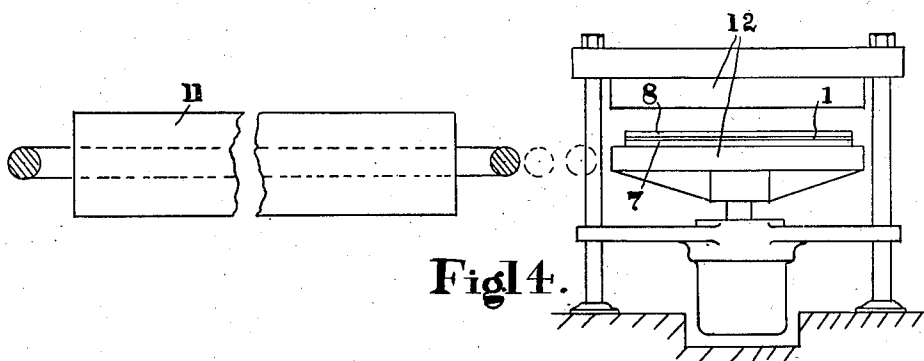


Fig. 14

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UNITED STATES PATENT OFFICE.

FREDERICK JAMES COMMINS, OF WESTMINSTER, LONDON, AND ARTHUR HENRY JAMES WRIGHT, OF HIGHAM, ENGLAND.

ROOFING AND OTHER SHEET AND PROCESS FOR MAKING SAME.

Application filed July 6, 1925, Serial No. 41,818, and in Great Britain April 4, 1925.

This invention relates to metal reinforced pitch fibre composition sheets for roofing and other purposes and to a process for producing the same.

- 5 According to the invention felted fibrous pulp and pitch composition with an intervening layer or coating of adhesive is applied to each side of a perforated metal sheet, preferably perforated by stabbing so that it is
10 provided with a multiplicity of small projecting tongues, and the composite body so formed is subjected to heat and pressure whereby a reinforced composition sheet is produced having high tensile strength and
15 durable qualities rendering it suitable for use for roofing and other purposes even in tropical climates without fear of separation of the composition and its reinforcements under considerable variations in temperature.
20 The pitch pulp composition used is preferably prepared according to the process described in United States specification No. 1,511,949, it being understood that the term pitch is used to include natural pitch or
25 bitumen or other forms of pitch such as coal tar pitch.

In the accompanying drawings:—

- Figures 1 and 2 are, respectively, a plan and sectional elevation showing a fragment of one
30 form of reinforced composition sheet according to the invention, part of the composition being assumed to be removed.

- Figures 3 and 4 are, respectively, a plan and sectional elevation showing a fragment of
35 another form of reinforced composition sheet according to the invention, part of the composition being assumed to be removed.

- Figure 5 shows on an enlarged scale and in sectional elevation a small fragment of reinforcing sheet.
40

- Figures 6 and 7 are respectively a plan and sectional elevation showing a fragment of a
45 further form of reinforced composition sheet according to the invention part of the composition sheet being assumed to be removed.

- Figures 8 and 9 are respectively a plan and sectional elevation showing a similar form of reinforced composition sheet to that shown in
50 Figures 3 and 4 but corrugated.

- Figures 10 and 11 are two sectional elevations on an enlarged scale illustrating a fragment of reinforced composition sheet after
55 being subjected respectively to light pressure and to heat and heavy pressure.

Figures 12, 13 and 14 are diagrammatic
55 elevations illustrating suitable forms of apparatus used in succeeding stages of the process.

In one mode of carrying out the invention a thin steel reinforcing sheet 1 is used
60 which is perforated with dies so as to form holes 2 and projecting tongues 3. Any desired shape of die may be used for example such as to produce holes 2 and tongues 3 of
65 the segmental form shown in Figures 1 and 2 or holes 2 and jagged tongues 3 as indicated in Figures 3 to 8. The stabbing may be effected from one side of the sheet only, to force out the tongues 3 to one side of the
70 sheet as indicated in Figures 1 to 4, 5, 8 and 9 or from both sides, so as to force out tongues 3 to both sides of the sheet as indicated in
Figures 6 and 7.

The sheet provided with holes 2 and
75 tongues 3 of whatever form adopted is heated to about 250° C. for instance by passage through a travelling oven 5, Figure 12, and after passage through the oven is immersed in a bath 6 of molten adhesive. A
80 suitable adhesive is a glue composed of bitumen, india rubber and shellac, the bath 6 being heated so as to maintain the glue at a temperature of about 300° C. The metal
sheet is removed and excess glue is allowed to drain off, the sheet being kept at a temperature
85 sufficient to prevent thickening of the glue, for example, the sheet after removal from the bath may be held on edge over the bath until the excess glue has run off. The
90 sheet 1 so coated with glue on both sides is then laid upon a felted sheet 7, Figure 13, of pitch fibre composition, preferably a composition of cellulose fibre and a pitch, i. e. coal tar pitch, bitumen or natural pitch, peptized for instance, as described in the specification No. 1,511,949. A second sheet 8 of
95 similar pitch fibre composition and of similar or different thickness is laid upon the metal sheet 1. The sandwich so formed is then lightly pressed for instance by passage
100 through a pair of rollers 9, 9, the pressure being sufficient to force the composition sheets 7, 8, into close contact with the glue coating 10, Figure 10, to embed the tongues
105 3 in the composition, and to press the composition into the holes 2.

The lightly pressed reinforced composite sheet so formed is then subjected to heat and

heavy pressure, for instance, it is passed through an oven 11, Figure 14, and from thence into a hydraulic press 12.

The heavy pressure considerably reduces the thickness of the pitch fibre composition sheets 7, 8, forcing the composition into the holes so that the composition therein from the sheets 7, 8, becomes practically homogeneous, and the tongues 3 are somewhat flattened so that they form staples as it were, firmly gripping the composition, and a very firm adhesion results between the glue and metal and between the glue and composition so that a strong composite sheet is produced capable of resisting changes in temperature and variable weather conditions in practically any climate.

We claim:—

A method of producing a reinforced sheet for roofing and like purposes, consisting in providing a thin metallic plate formed with

a plurality of openings and tongues projecting from the plate and surrounding the openings, subjecting the plate to the action of heat, applying adhesive to both sides of the heated plate, applying a felted sheet of fibrous pulp and pitch to each side of the adhesively covered plate, subjecting the plate and felted sheet to light pressure to insure an intimate contact between the adhesive and felted sheet and embed the tongues into the felted sheet, and then subjecting the reinforced sheet successively to heat and pressure sufficiently heavy to materially reduce the thickness of the sheet, force the material through the holes of the metal sheet and bend the projecting tongues into the felted sheet.

In testimony whereof we have signed our names to this specification.

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ARTHUR HENRY JAMES WRIGHT.