

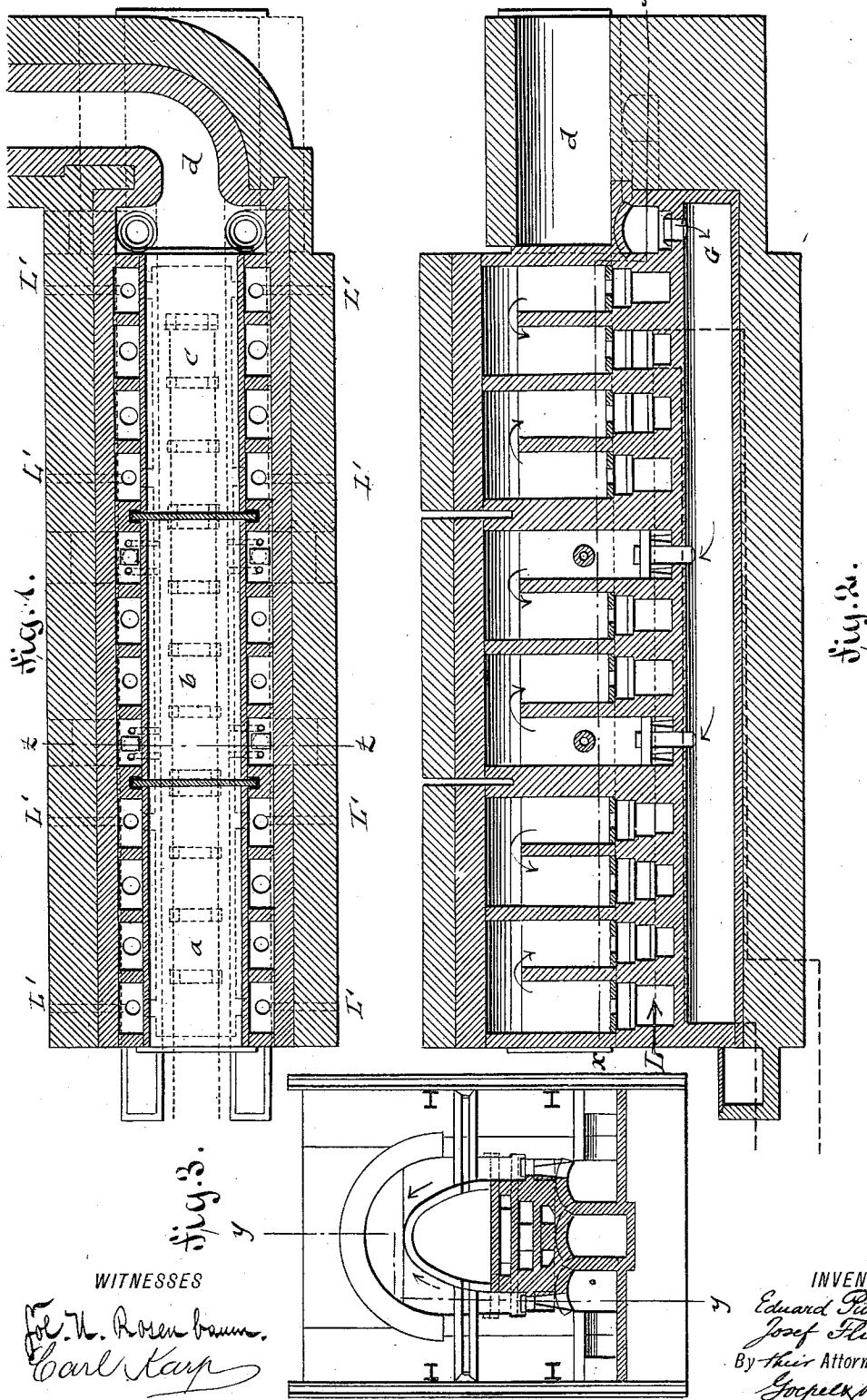
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E. PÜTTMANN & J. FLIEGEL.

METHOD OF ENAMELING METALLIC ROOFING PLATES.

No. 336,157.

Patented Feb. 16, 1886.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDUARD PÜTTMANN AND JOSEF FLIEGEL, OF HAGEN, PRUSSIA, GERMANY.

METHOD OF ENAMELING METALLIC ROOFING-PLATES.

SPECIFICATION forming part of Letters Patent No. 336,157, dated February 16, 1936.

Application filed December 16, 1885. Serial No. 185,828. (No specimens.) Patented in Luxemburg June 24, 1885, No. 548, and in Belgium June 30, 1885, No. 60,350.

To all whom it may concern:

Be it known that we, EDUARD PÜTTMANN and JOSEF FLIEGEL, of Hagen, Kingdom of Prussia, and Empire of Germany, have invented certain new and useful Improvements in Methods of Enameling Metallic Roofing-Plates, (which have been patented to us in Belgium, No. 69,350, dated June 30, 1885, and Luxemburg, No. 548, dated June 24, 1885,) of which
10 which the following is a specification.

This invention relates to an improved process of manufacturing roofing-plates of sheet-iron or sheet-steel, to be used for covering roofs, towers, walls, &c.; and the invention
15 consists of a process of enameling sheet-metal roofing-plates by dipping said plates into a liquid enamel, removing the surplus enamel by centrifugal action, baking the plates in muffles, and finally cooling the same.

20 In the accompanying drawings, Figure 1 represents a horizontal section on line xx , Fig. 2, of a baking-oven to be used with our improved process of enameling sheet-metal roofing-plates. Fig. 2 is a vertical longitudinal
25 section on line yy , Fig. 3; and Fig. 3 is a vertical transverse section on line zz , Fig. 1.

Similar letters of reference indicate corresponding parts.

In carrying out our invention, thin plates
30 of iron, steel, or other suitable metal are used, which may be pressed into corrugated form, so as to increase the resistance of the same. The plates are dipped into a liquid enamel, which is composed of the following ingredients:
35 Fifty-seven parts of silicic acid, twenty-four parts of carbonate of soda, ten parts of calcium, one and one-fourth part of nitrate of soda, six and one-fourth part of borate of soda, and one and one-fourth part of stannate
40 of soda.

The ingredients are mixed and melted in an open-hearth furnace, and ground when dry into a powder, and then mixed with ten per cent. of silicate of alumina, one tenth per cent.
45 of calcined borax, and water, so as to form a thin paste.

When it is desired to color the plates, the colors usually employed for coloring glass are added to the enamel.

50 The dipping of the sheet-metal plates into the enamel is effected by mechanical means

in such a manner that the submerging of the same takes place quickly while they are slowly taken out of the liquid enamel. It is very important for the process of enameling that the
55 plates be covered with a thin coat of enamel, which is to be as uniform as possible. The plates are next mounted in a suitable frame and placed in a centrifugal machine, so as to be rotated first in one direction and then in
60 the other direction. By centrifugal action the surplus enamel is removed from the plates and the enamel distributed uniformly over the surface of the same. The enameled roofing plates
65 are then placed into a baking-oven (shown in the drawings) that is composed of three or four compartments or muffles, which are separated by sliding partitions. The first compartment, a , is the drying or warming
70 muffle, in which the plates or tiles are dried. They are then removed into the second compartment, b , which is provided with mica-covered sight-tubes, so that the progress of the baking operation can be observed. The
75 roofing-plates are then moved into the third compartment, c , for tempering, and finally into the fourth compartment, d , which serves for cooling the plates or tiles.

The furnace is heated by gas generated in a separate furnace, the heating-gases entering
80 the furnace at G and the air at L , as shown in Fig. 3, in addition to which several additional air channels or inlets L' may be applied, as shown in Fig. 1.

A C in Fig. 3 represents the exit-flue, and
85 B the cleaning-flue.

The course of the gases of combustion is indicated in the drawings by arrows.

The enameled plates are placed on trucks and passed successively through the different
90 compartments or muffles of the baking-oven, which are situated one adjoining the other, so that the roofing-plates are baked in a quicker and more effective manner than by the ovens heretofore in use, while by the tempering of
95 the plates in the third muffle a more durable enamel is obtained, which is an essential feature for roofing-plates. The consecutive arrangement of the muffles produces, furthermore, a considerable saving in fuel, so that
100 the cost of the roofing-plates is reduced.

The enameled roofing-plates are bad con-

ductors of heat, are very durable, and form a light and strong roof, the enamel coating protecting the plates against electric and atmospheric influences.

5 Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The method herein described of manufacturing sheet-metal roofing-plates, which
10 consists, first, in dipping the sheet-metal plates into liquid enamel, then removing the surplus enamel by centrifugal action, and finally baking the same in baking-muffles, substantially as set forth.

15 2. The method herein described of manu-

facturing enameled sheet-metal roofing-plates, which consists of the following successive steps: first, dipping the sheet-metal plates into liquid enamel; second, removing the surplus enamel by centrifugal action; third, baking the plates; 20 fourth, tempering the same, and, finally, cooling the same, substantially as set forth.

In testimony that we claim the foregoing as our invention we have signed our names in presence of two subscribing witnesses.

EDUARD PÜTTMANN.
JOSEF FLIEGEL.

Witnesses:

GEO. KOCH,
ROB. W. SCHOENLE.