

(Specimens.)

J. NAGEL.
FIRE PROOF SHEET.

No. 292,037.

Patented Jan. 15, 1884.

Fig: 1.

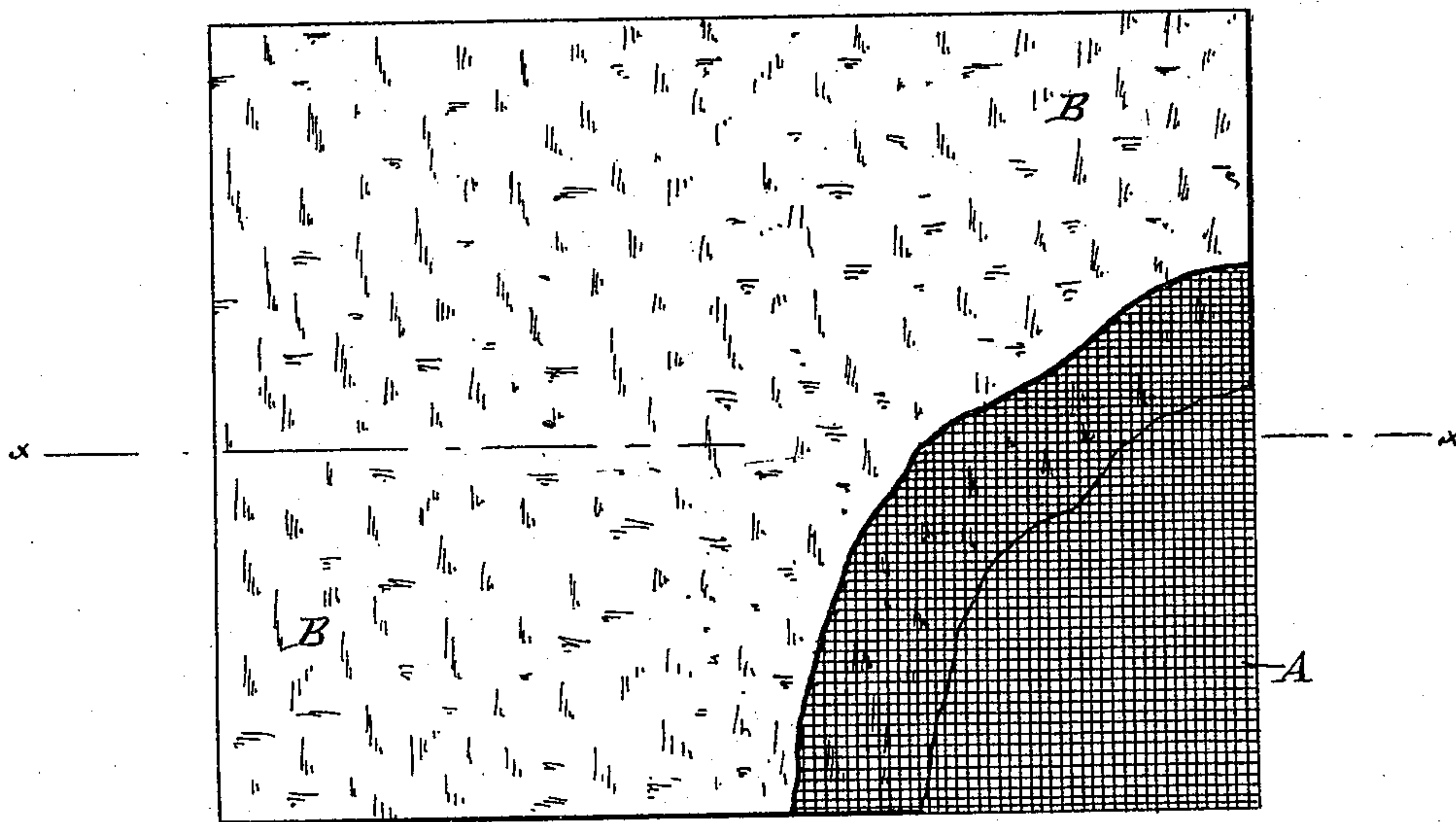
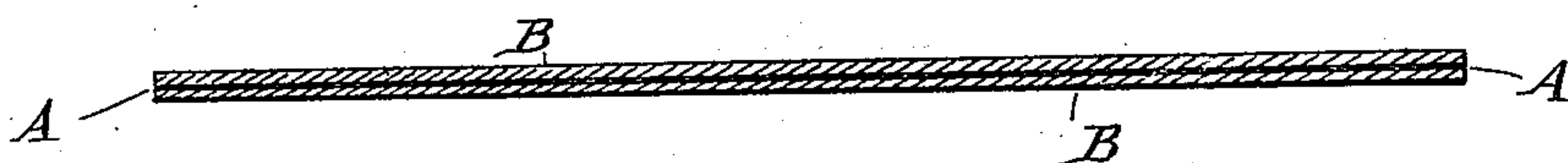


Fig: 2.



WITNESSES:

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INVENTOR:

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

JUNIUS NAGEL, OF VIENNA, AUSTRIA-HUNGARY.

FIRE-PROOF SHEET.

SPECIFICATION forming part of Letters Patent No. 292,037, dated January 15, 1884.

Application filed June 16, 1883 (Specimens.)

To all whom it may concern:

Be it known that I, JUNIUS NAGEL, of Vienna, Austria-Hungary, have invented a new and useful Improvement in Fire-Proof Sheets, of which the following is a full, clear, and exact description.

The object of this invention is to provide plates or sheets adapted to resist heat, fire, steam, or water, which sheets or plates are to be used as curtains, scenes for theaters, and for covering roofs or other objects which are to be protected from the effects of heat, fire, rain or other atmospheric influences.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a face view of my improved sheets, parts being broken out. Fig. 2 is a cross-sectional elevation on the line *xx*, Fig. 1.

The improved sheets or plates consist of one or more layers, A, of wire-netting or wire-cloth, on which a fire-proof mass, B, is applied, in a manner that will be set forth hereinafter.

The fire-proof mass consists either of a mixture of asbestos with a zinc oxide, asbestos with magnesia, or asbestos with lime, or mixture of all these substances in different proportions, according to the use to be made of the sheets. All these mixtures are saturated with a solution of sulphate of alumina, or a solution of a chloride of some metal, or with a mixture of these solutions, either after the said compound or mixture has been applied on the wire netting or cloth or while it is being applied.

The above-mentioned mixture may be applied on the wire cloth or netting, either wet or dry, by hand or by mechanical means. After the mixture has been applied on the wire cloth or netting, the netting thus treated is passed between rollers, which press the mass or mixture between the meshes of the netting. Fibrous gypsum, graphite, alumina, silicates, whiting, metal oxides, chalk, baryta, mountain leather, or other like amphiboles or hornblendes, mineral wool, glass wool, or any other suitable filling substances may be added to the above-mentioned mixture of asbestos and other ingredients. However, the principal ingredients will always be asbestos with

one of the three above-mentioned substances—that is, oxide of zinc, magnesia, or lime, or mixture of these and a metal-chloride or sulphate-of-alumina solution. Netting or cloth made of iron wire is best adapted for receiving and holding the mixture, and should have from six to thirty meshes per inch, according to the use to be made of the plates or sheets.

If the above-described plates are to be used for covering walls—that is, if they are to be glued over the plastering or studding—they can be made plain, white, or colored, or designs can be printed on the sheets in the same manner as designs are printed on sheets of paper for wall-papering. If desired, they can also be provided with a coating of glue on one side. If the sheets are to be used for covering roofs, graphite is added to give the sheets a darker color, and considerable more oxide of zinc is added for the purpose of making the plates stiffer. If the plates or sheets are to be used in the interior of a building, the materials are mixed in about the following proportions: asbestos, one hundred parts, by weight; oxide of zinc two hundred parts, by weight; whereas if the plates are to be used for covering roofs—that is, on the exterior of the building—the proportions are about as follows: asbestos, one hundred parts; oxide of zinc, three hundred parts; but the proportions can be varied very much, according to the use to be made of the sheets. As a rule, not less than seventy-five parts and not more than four hundred parts of zinc oxide, magnesia, lime, or mixture of these ingredients should be mixed with every one hundred parts, by weight, of asbestos.

I will now give a detailed description of the manufacture of the sheets or plates, but wish to state that in place of the zinc oxide any other of the above-mentioned analogous ingredients can be used, and in place of the solution of chloride of zinc for impregnating, any other solution of a metal chloride, or a sulphate of alumina, or mixture of the same, can be used. The asbestos is disintegrated in some suitable manner, and is then mixed dry with the oxide of zinc in some suitable mixing apparatus. This mixture is then applied on both sides of the wire netting or cloth, which is then passed through rollers, whereby the

mixture will be pressed in the meshes of the wire netting or cloth, and the sheets will have the appearance of pasteboard. At the same time that the sheets or plates are passed between the rollers they are saturated with a chloride-of-zinc solution of about from 40° to 50° Baumé. This can be accomplished best by passing a series of belts through the solution and over the rollers, so that the solution will be conveyed by the said belts to the sheets as the same are passing through the rollers. The sheets are then washed or soaked to deprive them of the superfluous chloride of zinc. Those plates which are to be highly water-proof are not washed or soaked, but are saturated or treated with a solution of soap, or with other fatty substances, and, if necessary, are saturated with a solution of sulphate of alumina, whereby insoluble sebacic alumina is formed. If it is desired that these plates shall have very smooth surfaces, powdered glass or any other flux is added to the mixture, and the plates are then exposed to a very high temperature. If the hardening is to take place very slowly, borate salts are added to the mixture.

In place of wire-netting, any other suitable fabric or webbing may be used.

I do not abandon or dedicate to the public any patentable features set forth herein and not hereinafter claimed, but reserve the right

to claim the same either in a reissue of any patent that may be granted upon this application or in other applications for Letters Patent that I may make.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. As an improved article of manufacture, fire-proof plates or sheets made substantially as herein shown and described, and consisting of wire cloth or netting or other fabric on which a mixture of asbestos and oxide of zinc, magnesia, lime, or analogous substances is applied, which mixture is saturated with a solution of sulphate of alumina or metal chloride, as set forth.

2. The herein-described method of making fire-proof sheets or plates, consisting of applying a mixture of asbestos and oxide of zinc, magnesia, or lime on wire netting or cloth, then pressing the said mixture into the meshes of the netting or fabric, and then saturating the fabric with a solution of sulphate of alumina or a metal-chloride solution, substantially as set forth.

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

JUNIUS NAGEL.

Witnesses:

WILLIAM HÜNING,
JAMES RILEY WEAVER.

Correction in Lette Patent No. 292,037.

It is hereby certified that Letters Patent No. 292,037, granted January 15, 1884, upon the application of Junius Nagel, of Vienna, Austria-Hungary, for an improvement in "Fire-Proof Sheets," should have contained the following clause, setting forth certain foreign patents which had been obtained by the said Junius Nagel, viz:

"Subject to the limitation prescribed by Section 4887 of the Revised Statutes, by reason of Belgian Patent No. 62,686^B, dated September 24, 1883, and Italian Patent XVII 15,904 and XXXI 393, dated September 26, 1883."

It is further certified that the United States Letters Patent No. 292,037 should be read with this clause inserted in the grant thereof, thereby limiting its term, and to make it conform to the files and records pertaining to the case in the Patent Office.

Signed, countersigned, and sealed this 15th day of April, A. D. 1884.

[SEAL.]

M. L. JOSLYN,
Acting Secretary of the Interior.

Countersigned:

BENJ. BUTTERWORTH,
Commissioner of Patents.