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COMPLETE SPECIFICATION.

A New or Improved Process for the Production of a Substitute for Glass Sheets or Plates and other Articles.

I, BENNO BORZYKOWSKI, Director, of Charlottenburg, Berlin, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 Sheets or plates and other articles made from ordinary glass have not only the drawback that they are extremely fragile but also that they are difficult to manufacture in quantities, if for instance plates have to be made with polished surfaces or provided with a design. The pattern or polish on the surface has to be produced by a process of grinding, etching, sandblasting, moulding or the like, and consequently the process has to be gone through for each separate article.

10 Various attempts have been made to produce satisfactory substitutes for glass sheets or plates and for other articles made from ordinary glass, and it has already been suggested to utilise nitro-cellulose for this purpose. Experiments have, however, proved that nitro-cellulose and its derivatives are not suitable for the production of a substitute for glass which is to be not easily breakable and not inflammable. The reason of this is that nitro-cellulose is extremely explosive whilst the derivatives are wanting in strength, transparency and ability to stand changes of weather as they take up more or less moisture and warp.

The present invention relates to the production of a perfect substitute for ordinary glass sheets or plates, plates with patterns thereon and the like. This substitute consists of a composition of acetyl cellulose or a mixture of acetyl cellulose with other cellulose derivatives and gelatinous substances.

25 Another feature of the invention lies in producing a substitute for glass which substitute may have either a polished or a figured surface by pouring the material, which as before stated consists of acetyl cellulose or a mixture of acetyl cellulose and ordinary cellulose derivatives or gelatinous substances, over a surface or into a matrix which is either smoothly polished when a polished article is to be produced or is furnished with a suitable design when an article provided with a pattern has to be produced.

30 After the mass has been dried, the plates can be removed from the surface, mould or the like and have, without further treatment being necessary, the pattern or the surface reproduced on their own surfaces with perfect accuracy. If the surface or the pattern or mould is smooth and highly polished the article cast possesses a highly polished surface and is just as transparent as a ground and polished article of glass. Plates and other articles with a design on the surface made from the material forming the substitute for glass can also be obtained if the design required is produced on the surface for the reception of a material by photo-chemical, mechanical, photo-mechanical and other similar methods. For instance, if a particular portrait or some desired landscape has to be produced on a plate of the material forming the substitute for glass, the object must be photographed to the required size in which it is to appear on the plate. The negative thus obtained, or in some cases, the film on this negative bearing the picture, is hardened with formaline, alum or the like and

[Price 8d.]

Improved Process for the Production of a Substitute for Glass Sheets or Plates, &c.

if necessary fixed or burnt in and then this forms a matrix for the pattern which has to be made.

I will now give, by way of example details of proportions of ingredients by which the substitute for glass may be made.

I take 10 parts by weight of prepared cellulose, which has been boiled and bleached, which may be cotton or the like, and I dissolve this in 100 parts of a mixture of equal parts of acetic acid of 98% strength and acetic anhydride, adding if desired from 25 to 50 *per cent.* of the weight of the cellulose of a substance such as hydrochloric acid at a temperature below the boiling point of the acetic acid. A clear viscous mass is produced which gives a suitable product either by pouring directly upon plates and evaporating or by precipitating in some suitable liquid, water for instance, and if necessary freeing the mixture from the acid contained.

The product, when freed from acid, may also be dried and dissolved in a hot or cold solvent solution, for example acetone, chloroform, benzol, alcohol or the like, or mixtures thereof and then poured on to plates or moulds.

Other cellulose derivatives may be added to the solution before evaporation, for instance solutions of formyl-cellulose, viscous or gelatinous substances, glue, wax, resin, and the like according to requirements.

As the process of casting the material of the glass substitute with the properties already described, on a suitably shaped surface is considerably cheaper and more satisfactory than the process hitherto in use for manufacturing articles from ordinary cellulose glass and the like and as, moreover, the articles made from the substitute for glass possess, when compared with ordinary glass the advantage of being unbreakable, close-grained and flexible and able to stand changes of temperature it follows that the articles made from the glass substitute will be capable of being put to more numerous uses than those of ordinary glass.

The material being unbreakable is particularly suitable for use on moving bodies, for instance on vehicles, railway carriages, motor cars, doors and the like.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A process for the production of plates, sheets or other articles as a substitute for glass consisting in taking pure acetyl cellulose or a mixture of pure acetyl cellulose and other cellulose or gelatinous materials, which substance or mixture is non-inflammable, able to withstand changes of temperature and weather, close-grained and flexible, pouring same on to a surface or into a matrix provided with a pattern or the like which is to be produced upon the substitute for glass and after the solvent has evaporated and the material has set, simply removing the same from the surface or matrix forming the mould substantially as set forth.

2. In the production of an article forming a substitute for glass and made by the process claimed in Claim 1, a mould or its equivalent the surface of which is covered with a film provided with a picture or design which is hardened on to the surface after the design has been photographed or copied substantially as set forth.

3. A substitute for glass manufactured substantially as described.

Dated this 19th day of September, 1910.

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