UNITED STATES PATENT OFFICE.

ALFRED LUCK, OF DARTFORD, AND CHARLES F. CROSS, OF LONDON, ENGLAND.

PROCESS OF INCREASING STABILITY OF NITROCELLULOSE.

SPECIFICATION forming part of Letters Patent No. 665,792, dated January 8, 1901.

Original application filed March 27, 1899, Serial No. 710,699. Divided and this application filed February 6, 1900. Serial No. 4,228. (No specimens.)

To all whom it may concern:

Be it known that we, ALFRED LUCK, chemist, residing at "Brentcote," Dartford, in the county of Kent, and CHARLES FREDERICK CROSS, chemist, residing at 4 New Court, Carey street, London, England, citizens of England, have invented a certain new and useful Process for Increasing the Stability of Nitrocellulose, (for which we have applied for a Patent in Belgium April 17, 1899, No. 142,091; in Canada August 9, 1899, No. 86,782; in France April 15, 1899, No. 282,320; in Germany April 17, 1899; in Great Britain September 3, 1898, No. 18,868; in Italy May 31, 1899, No. 90, Vol. CIX; in Norway May 10, 1899, and in Sweden May 8, 1899,) of which the following is a specification.

Our invention, which was originally disclosed in our Patent No. 647,420, granted April 10, 1900, relates to a process for rendering cellulose nitrates stable by treating them with solutions of lead or zinc salts, such as nitrate or acetate of lead and the acetate or chlorid of zinc.

Our process as applied to nitrocellulose or guncotton which has been purified as much as possible in the usual way by long-continued boiling and washing is as follows: At the completion of this ordinary purification process in the usual course of manufacture the guncotton is in the form of fibrous particles freely suspended in water. This excess of water is then in the ordinary course of manufacture removed by means of a centrifugal machine containing a cloth or gauze, which allows the water to escape and holds back the guncotton.

In carrying out our process we prefer simply to add about one per cent. of a soluble salt, calculated on the weight of guncotton to the vessel holding the guncotton and water before it passes into the centrifugal machine. The whole mass is then boiled for about a half an hour or more at 80° to 100° centigrade, the guncotton is allowed to settle, and the supernatant liquid portion containing the salt is run off. Fresh cold water is run into the vessel and is well mixed with the guncotton. The mixture is again allowed to settle and the supernatant liquid is again removed. The washing is repeated several times for the purpose of removing all of the soluble salt. The guncotton is then separated in the form of the usual pulp (containing about thirty per cent. water) by means of the ordinary centrifugal machine, and the stabilizing operation is complete.

In the above description the salt employed is supposed to be chlorid of zinc. If a lead salt is used, the guncotton when mixed with it would be required to be boiled three hours or even more.

When the guncotton is not purified to the full extent obtainable by the ordinary process, it would require boiling with the salt a very much longer time, in some cases up to thirty-six or forty-eight hours, depending entirely upon the incompleteness of the purification.

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

1. The herein-described process for increasing the stability of nitrocellulose which consists in adding to the nitrocellulose an aqueous solution of a metallic salt, digesting the same at a suitable temperature and then washing the digested mixture.

2. The herein-described process for increasing the stability of nitrocellulose which consists in adding to the nitrocellulose an aqueous solution of metallic salt, digesting the mixture at a temperature of 80° to 100° centigrade and then washing the digested mixture.

3. The herein-described process for increasing the stability of nitrocellulose which consists in adding to the nitrocellulose an aqueous solution of a metallic salt in such quantity as will bring the mixture to a creamy substance digesting the mixture at a temperature of 80° to 100° centigrade and then washing the digested mixture.

4. The herein-described process for increasing the stability of nitrocellulose which consists in adding to the nitrocellulose an aqueous solution of chlorid of zinc, digesting the said mixture at a suitable temperature and then washing said digested mixture.

5. The herein-described process for increas-

ing the stability of nitrocellulose which consists in adding to the nitrocellulose an aqueous solution of chlorid of zinc in such quantity as will bring the mixture to a creamy substance, digesting the mixture at a temperature of 80° to 100° centigrade and then washing said digested mixture.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

ALFRED LUCK.
C. F. CROSS.

Witnesses:
GERALD L. SMITH,
WALTER J. SKERTEN.