UNITED STATES PATENT OFFICE.

BERT L. WILLIAMS, OF LOWELL, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO FRED ALSON BRYANT, OF LOWELL, MASSACHUSETTS.

PHOTOGRAPHIC DEVELOPER.

No. 838,488. Specification of Letters Patent. Patented Dec. 11, 1906.

Application filed September 6, 1904. Serial No. 223,414.

To all whom it may concern:

Be it known that I, BERT L. WILLIAMS, a citizen of the United States, residing in Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Photographic Developers, of which the following is a specification.

This invention relates to photographic developers of that variety which are adapted for so-called "gas-light development papers," or papers designed to be exposed to artificial light or to diffused daylight and not to the direct rays of the sun.

The developer herein described is not suitable for films, plates, (except lantern-slide plates or other diapositives,) or for bromid papers.

The objects of this invention are to produce a developer which will not poison the hands; which will keep indefinitely before use without oxidation and for a very long time, almost indefinitely, after use; which will require only about half the usual time of exposure; which will secure purity of high lights and half-tones, perfect blacks, and uniformity of tone; which will correct the greenish-brown effect of an excess of bromid of potassium in the developer, and which will insure an absolute freedom from the friction-marks or abrasion-marks on glossy paper. I accomplish these results by introducing into any developer of the amidophenol group for gas-light papers about three grains of a soluble salt consisting of iodin combined with a base to an ounce of normal developer, using, preferably, iodid of potassium, by "normal developer" meaning developer of usual strength as used. Of course the concentrated developer will require a proportionately larger amount of the salt of iodin.

I have obtained entirely satisfactory results by using a developer of the following-named ingredients in the proportions stated below: to fifty ounces of water add successively thirty-five grains of metol, one hundred and fifty grains of hydroquinone, one hundred and fifty grains of iodid of potassium, five hundred and fifty grains of dry sulfite of soda, twelve hundred grains of dry carbonate of soda, and five grains of bromid of potassium. Still better, to clear the high lights and half-tones of the print, I may add (but do not consider it essential) to the foregoing ten drops of the following solution, namely: water, eight ounces; bromid of ammonium, one ounce; and bichromate of potash, one ounce.

All of the above-named ingredients, except the iodid of potassium, have been combined and used in substantially the proportions named for developing photographic papers of the class first above specified.

With this developer as heretofore used (without the iodin salt) the least variation in the exposure or in the age of the developer is likely to cause dirty brownish tones, and an excess of bromid of potassium in the developer will give a greenish-brown effect.

I have discovered that the addition of the soluble iodin salt in the developer corrects all the troubles hereinbefore mentioned and implied, produces a fine clear tone, a perfect black, clear high lights and half-tones, and that a considerable variation in the proportion of bromid of potassium does not affect the tone of the print.

The developer containing the iodid can be used repeatedly until exhausted and may be renewed as to quantity by adding new developer to the old without affecting the tone of the print. The use of this developer reduces the time necessary for exposure by one-half and develops glossy papers without abrasion-marks, sometimes called "friction-marks."

Heretofore the only means of preventing abrasion-marks has been the use in the developer of hyposulfite of soda or cyanid of potassium, both of which render necessary a longer exposure and injure the tone of the print. The cyanid of potassium is also a deadly poison.

I do not intend to confine myself to the formula for a metol-hydroquinone developer above given, because the addition of a soluble iodid in about the proportion of three grains to the fluid ounce of normal developer to any of the developers used for gas-light development papers and diapositives will produce the beneficial results above described.

I claim as my invention—

1. A photographic developer, including an amidophenol developing agent, and a soluble iodid, substantially as specified.

2. A photographic developer, including an amidophenol developing agent, and iodid of potassium substantially as specified.

3. A photographic developer, including an amidophenol developing agent, a soluble iodid, and bichromate of potash, substantially as specified.

4. A photographic developer, including an amidophenol developing agent, a soluble iodid, bichromate of potash, and bromid of ammonium, substantially as specified.

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

BERT L. WILLIAMS.

Witnesses:
ALBERT M. MOORE,
GRACE CROWLEY.