UNITED STATES PATENT OFFICE.

LOUIS BERTLING, OF PENGE, COUNTY OF SURREY, ENGLAND.

LITHOGRAPHIC PROCESS, &c.

SPECIFICATION forming part of Letters Patent No. 373,331, dated November 15, 1887.

Application filed May 3, 1887. Serial No. 236,986. (No specimens.) Patented in England April 14, 1887, No. 5,464.

To all whom it may concern:

Be it known that I, LOUIS BERTLING, lithographic artist, a subject of the Queen of Great Britain, and a resident of Penge, in the county of Surrey, England, have invented a new and useful Improved Process for Facilitating the Reproduction of Lithographic Pictures, Designs, or Delineations, which invention comprises improved compositions and paper for use in such process, (for which I have applied for provisional protection in Great Britain, No. 5,464, bearing date April 14, 1887,) of which the following is a specification.

My invention relates to the art of lithography, and comprises an improved process, also improved compositions and paper to be employed therein.

The object of the said invention is to provide means whereby one or more impressions of any picture, drawing, design, writing, or other matter taken from a lithographic stone upon which the same has been produced in an ordinary or well-known manner may be rendered capable of subsequent reproduction upon a lithographic stone, so that copies can be obtained therefrom in the usual manner, thus avoiding the necessity either for keeping the design or other work upon the first stone for future use or (when the said design or other work has been removed therefrom) for redrawing or preparing the same design again whenever further copies thereof may be required.

It is well known to lithographers and others that considerable difficulty is constantly experienced by reason of the fact that no means have heretofore been known whereby a picture or design produced upon a stone could be preserved for any great length of time in a condition for future lithographic reproduction otherwise than by retaining the same upon the stone itself, and that consequently many designs have to be destroyed by removal from the stone after the number of copies required at first have been "pulled," although there is often a probability that more copies will be subsequently required; and this removal has to be effected because it is practically impossible to keep more than a limited number of stones "locked up" or out of use in this manner. On the other hand, it is frequently essential that certain designs should be kept ready for reproduction from time to time, and, moreover, in the case of very expensive work, it is obviously frequently important that it shall not be destroyed by removing it from the stone, the reproduction by the artist being either impossible or impracticable. Consequently it is always the case in lithographic establishments that a very large number of stones are thus constantly locked up or inoperative, which is a matter of considerable importance both with respect to the storage-room required and to the increased capital which is necessary to provide a sufficient quantity of stones for the current work; but by means of my invention this difficulty is entirely obviated, as I am thereby enabled to obtain an impression upon paper which is capable of being retained for years in such a condition that it can be transferred to stone whenever required, so as to be printed from in the ordinary manner practiced in lithography. Therefore, by the employment of my said invention every lithographic stone can be released for further use immediately the requisite number of copies have been pulled—that is to say, the design or drawing may be removed, and yet at the same time one or more copies thereof can be retained in convenient form—viz., upon a sheet of paper—and in such a condition as to be capable of reproduction at a future time, if required.

My improved process consists in taking an impression of the design, drawing, or other work from the lithographic stone upon transfer-paper prepared in the manner hereinafter described, and then dusting over the impression so obtained a fine dry transfer-powder rich in fatty materials, and made of the ingredients hereinafter specified. The greasy character of the said powder renders the design to which it is applied upon this paper capable of being transferred to stone at any subsequent time within a period of years, (say five or ten years,) and yet the dryness of the powder is such that there is no danger of the design being destroyed by rubbing off through contact with paper or other material with which it may be placed when stored for future use. The said transfer-powder, which constitutes the most important feature of my invention, is composed of spermaceti, sperm-oil, and finely-powdered charcoal combined in the following

manner—that is to say, I take two pounds of spermaceti, two pounds of charcoal, and eight ounces of sperm-oil, and treat them as follows—that is to say, I melt the spermaceti in a suitable vessel, preferably by putting the latter into boiling water for this purpose. When the spermaceti is completely melted, I add thereto the sperm-oil and powdered charcoal, stirring the whole for about ten minutes, after which I pour the mixture upon a slab of stone, marble, or other material to allow the same to cool. During the time in which this cooling is taking place I break or cut the mass into small pieces with a palette-knife or other suitable instrument for the purpose of facilitating the subsequent pulverization. When the mixture is quite cold, I pulverize it in any suitable manner, so as to reduce the same to a very fine powder, and then I pass it through a fine sieve or through muslin. The powder thus produced is then put into boxes or other receptacles for use, as hereinafter explained.

I prefer to use vegetable charcoal; but animal charcoal might be employed, although I do not consider it so advantageous for the purpose. Instead of spermaceti I may use mutton-suet, and instead of sperm-oil I may employ palm-oil; but the composition so made would not effect the purpose of my invention so advantageously.

I make the transfer-paper, hereinbefore referred to, in the following manner—that is to say, I take good printing-paper which is not too hard, (say about three-fourths sized.) I coat the same on one side with a strong solution of boiled starch, which must be of such a consistency as to work freely. When this coating material is dry, I apply a second coating of the same, but of a thinner consistency, so as to insure a smooth surface. This second coating having become dry, I apply a third coating, which consists of a very weak thin solution of gum-arabic, which has therein some gallic acid, the proportion of the ingredients being about half an ounce of the acid to a gallon of the gum solution. When this third coating is dry, the paper is to be well rolled upon both sides thereof, and is then ready for use whenever required.

The production of the transfers to be retained for future use, which is the essential object of my invention, is effected in the following manner—that is to say, the picture, design, drawing, or other work of which lithographic copies are required having been produced upon the stone in any well-known manner, I pull one or more transfers therefrom in the ordinary manner, excepting that they are taken upon the specially-prepared transfer-paper, hereinbefore described. In this operation ordinary lithographic transfer-ink may be used; but I prefer to employ the specially-prepared ink, hereinafter described. Having thus obtained one or two impressions, (or whatever number may be required to be stored away for future reproduction,) I apply thereto some of the transfer-powder, hereinbefore described, by dusting the transfers all over therewith, and then I remove any surplus powder with a soft camel-hair brush, and then wipe carefully with a soft rag, so as not to leave any of the powder loose upon the sheet. The transfer is then in a condition to be packed away for future use, and when the number of copies of this particular design required at the time have been pulled from the stone the latter may be cleaned and used at once for other work, the design having been preserved for reproduction, as explained. It is preferable to pull these transfers for future use before pulling the ordinary copies required at the time; but if desired such ordinary copies may be pulled first and the special transfers afterward.

When one of my prepared paper transfers, obtained as above described, is to be used for reproducing the design or picture upon a lithographic stone, I proceed as follows—that is to say, I fit a perfectly clean and polished lithographic stone in the press and warm the stone by applying boiling water to the same, and while the stone is damp I place the said paper transfer upon the same and pull it through the press as quickly as possible. Then I dampen the paper with hot water and pull through the press again, and repeat the same operation until the paper can be removed easily from the stone. The latter must now be allowed to dry without washing off the composition which has been transferred thereto from the paper, as this will answer the purpose of preparing the stone. If the transfer is not a very old one—that is to say, one which was obtained a long time previously—the stone will now be ready for "rubbing up" with a fatty or greasy rag and for "rolling up" in the usual manner. Should the transfer be an old one, it would be desirable to expose the stone for a short time to a gentle heat before a fire after the picture or design has been transferred thereto; or the heating may be effected by passing the flame of a spirit-lamp over the stone several times, or by any other suitable means. The stone will then be ready for use and lithographic copies may be obtained therefrom in the usual manner. Transfers may also be obtained from this stone on my prepared paper, as hereinbefore described, for future use.

Although, as above stated, ordinary lithographic transfer-ink may be used when taking the impression upon my transfer-paper for future use, I prefer to use an ink which is of a more greasy or fatty character than is desirable in the transfer-ink to be used for ordinary lithographic copies, as the more greasy ink is better adapted for the reception of the powder which has to be applied, as hereinbefore described, after the impression has been obtained. I therefore provide a special ink for this purpose, which contains the following ingredients in the proportions, or substantially

so, named below, viz: Mutton-suet, four ounces; yellow beeswax, three ounces; white curd-soap, three ounces; shellac, six ounces; vegetable black, twenty ounces; middle litho varnish, three pounds; sperm-oil, four ounces, spermaceti, three ounces. In making this ink I first melt the mutton-suet, wax, and spermaceti, and when the mixture is sufficiently hot I ignite the same, and while it is burning add the curd-soap. Then I extinguish the flame and add the shellac, stirring the mixture continuously until all is well mixed. This having been effected, the sperm-oil, litho varnish, and vegetable black are introduced, and the whole well stirred together. The mass should then be poured into tins for use when required.

What I claim is—

1. The improved process for obtaining lithographic transfers, consisting in taking from the stone upon which the picture or design has been produced an impression thereof upon paper prepared with starch and gum-arabic, substantially as described, and then applying thereto a composition in the form of powder composed of spermaceti and sperm-oil, (or their equivalents,) combined with charcoal, all substantially as and for the purpose above set forth.

2. The composition in the form of powder, consisting of spermaceti and sperm-oil, (or their equivalents,) combined with charcoal, in or about in the proportions herein set forth.

3. The improved lithographic ink consisting of the ingredients ordinarily used in the manufacture of such ink, in combination with sperm-oil and spermaceti, as and for the purpose hereinbefore described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS BERTLING.

Witnesses:
A. G. WEAVER,
WALTER J. SKERTEN.