

(No Model.)

2 Sheets—Sheet 1.

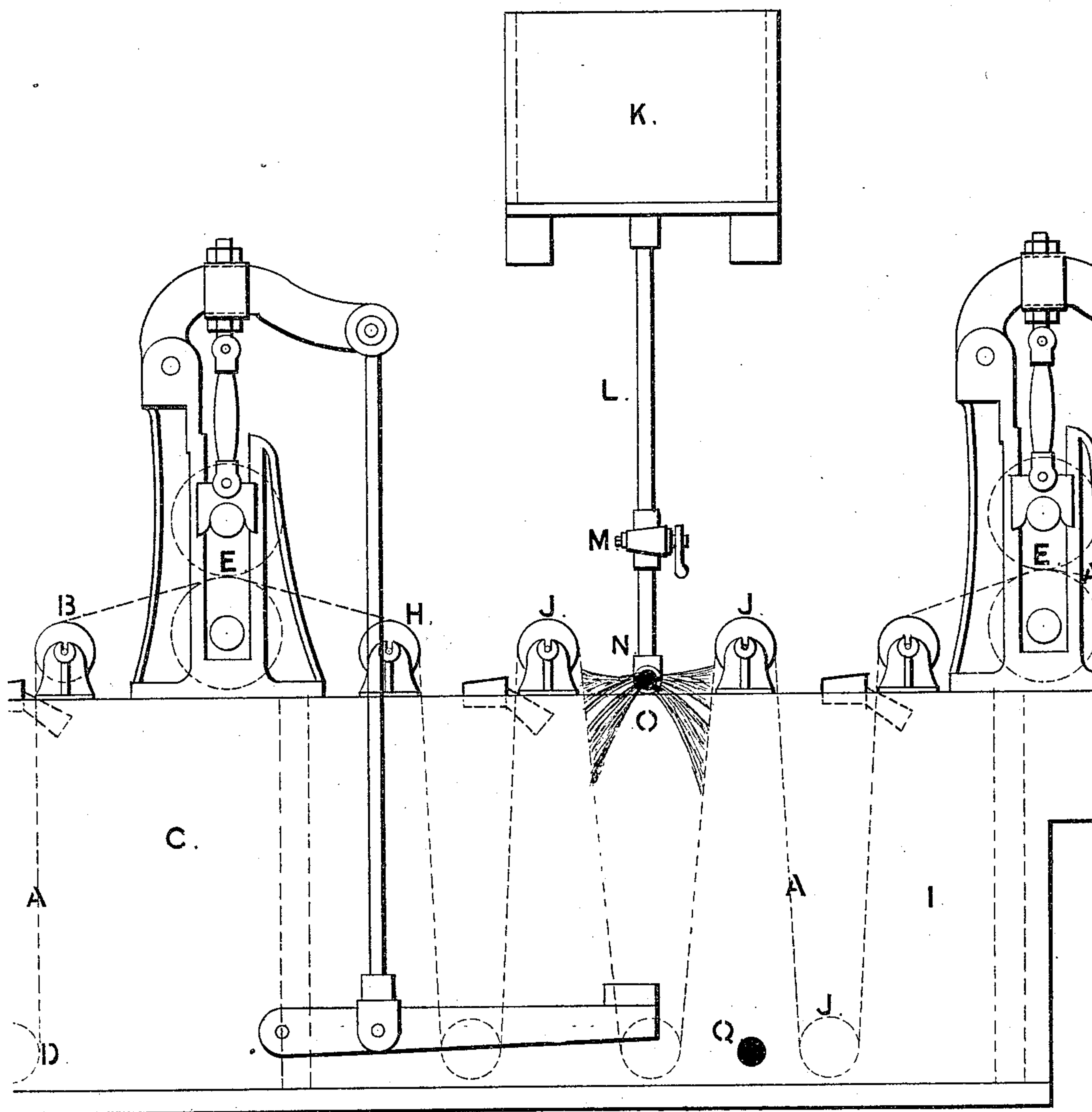
J. J. LELOIR.

DYEING ANILINE BLACK UPON COTTON.

No. 248,934.

Patented Nov. 1, 1881.

FIG. 7



WITNESSES

WITNESSES
Walter Jas. Turner
Samuel A. Crump

INVENTOR

Jules Joseph Helwig

(No Model.)

2 Sheets—Sheet 2.

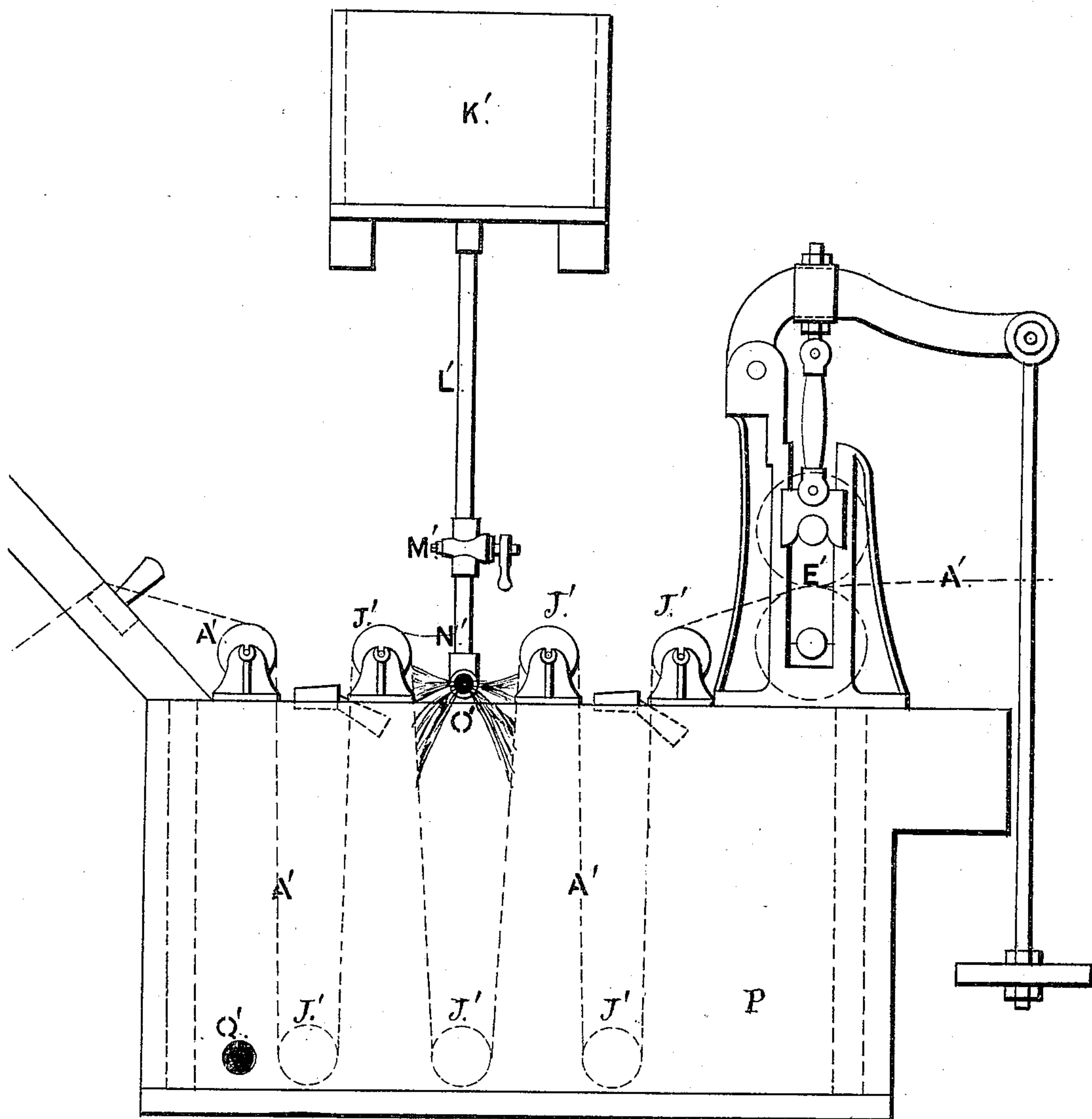
J. J. LELOIR.

DYEING ANILINE BLACK UPON COTTON.

No. 248,934.

Patented Nov. 1, 1881.

FIG. 2



WITNESSES

Walter J. Turner
Samuel A. Granger

INVENTOR

Julien Joseph Leloir

UNITED STATES PATENT OFFICE.

JULES J. LELOIR, OF TOURCOING, FRANCE, ASSIGNOR TO ERNEST POSSELT AND RUDOLF PETERS, OF THE FIRM OF E. POSSELT & CO., OF BRADFORD, ENGLAND.

DYEING ANILINE-BLACK UPON COTTON.

SPECIFICATION forming part of Letters Patent No. 248,934, dated November 1, 1881.

Application filed September 7, 1880. (No model.) Patented in England January 31, 1880.

To all whom it may concern :

Be it known that I, JULES JOSEPH LELOIR, of Tourcoing, in the Republic of France, have invented new and useful Improvements in Dyeing Cotton Warps and Cotton Aniline-Black, (for which English Letters Patent have been granted to Ernest Posselt and Rudolf Peters, of the firm of E. Posselt & Co., of Bradford, in the county of York, England, No. 445, dated January 31, 1880, sealed 2d April, 1880;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The said invention relates to dyeing cotton warps or cotton with aniline-oil or its salts by a process in which the usual plunge-baths containing dye-liquids are not employed. The warps are made to pass over rollers which are fitted in an empty, or nearly empty, cistern, the warps having been previously damped and prepared in heated water. The warps, in traveling through the cistern, receive the dye mixture or liquor, which falls on the warps or cotton fabrics as they pass through the cistern, receiving a shower of the mixture and imbibe the mixture, and also in passing under the bottom rollers, as a small height of the mixture from the shower remains in the cistern. The dye materials are placed in a tank, which is placed above the empty, or nearly empty, cistern, and fall on the warps through a perforated pipe, which is connected to pipes fitted to the bottom of the tank, and the pipes are fitted with a tap or valve to turn the dye-liquid on and off. For this purpose in the top tank is placed water, muriatic acid, chloride of iron, chlorate of potash, sulphate of copper, and aniline-oil. The dye liquid or liquor falling on the warps as they pass through the cistern, the warps imbibe the coloring-matter falling on them, and in passing under the bottom rollers. When the warps have passed on through the cistern, or passed through until the necessary action is received, they are removed and placed in a convenient room or place to age, and after dyeing they are passed through another cistern and made to travel over and under rollers fitted therein. The warps then

receive a solution of bichromate of potash acidulated with muriatic acid, and this mixture is made or placed in a tank which is fitted over the cistern, through which pass the warps, and the mixture flows on the warps through a pipe or tube perforated with small holes, and the warps also imbibe some of the mixture in passing under the bottom rollers. This last operation fixes the color, and the warps are dyed fast and fine aniline-black; but in order to make the improvements better understood, I will proceed to more particularly describe the same by reference to the accompanying drawings, in which—

Figure 1 represents a side elevation of a cistern having two compartments—one for preparing the cotton warps in heated water, the other for the coloring-matter—and fitted with the shower-bath apparatus. Fig. 2 represents a side elevation of a cistern also fitted with a shower-bath apparatus and for the solution of bichromate of potash and muriatic acid.

Similar letters are employed to represent similar parts.

The cotton warps A are made to pass over the roller B into the cistern C, which contains heated water. They pass through the cistern over the rollers B and under the rollers D, then through the squeezing-rollers E, care being taken to keep a good pressure on the squeezing-rollers, so as to keep the warps as free as possible from water. The warps pass on over the roller H into a cistern, I, or second compartment, and travel on over the rollers J and through the squeezing-rollers E, then through a folder into any suitable receiver.

I would have it understood that in the present application I lay no claim to the apparatus, but reserve the same for a future application.

Over the cistern, or in any convenient overhead position, I fix a tank, K, to which is fitted a pipe, L, communicating with the tank, and to the pipe L is secured a tap, M, to regulate the supply of the coloring-matter placed in the tank. The bottom of the tap is fitted with a small pipe, N, to which is fixed a perforated tube, O. The mixture placed or made in the tank K may be composed of water, thirteen and one-fourth gallons; solution of chlo-

ride of iron, thirteen and one-fourth gallons; aniline-oil, three and one-half gallons; muriatic acid, four and one-half gallons; chlorate of potash, six and one-fourth pounds; sulphate of copper, four and three-fourths pounds. These proportions vary according to the weight of the warps or cotton goods to be dyed, provided an equal strength be given. The mixture or liquor passes through the pipe L, tap M, and perforated tube O, and falls in a shower on the warps traveling through the compartment or cistern I. The shower of liquor or mixture impregnates the warps or cotton fabrics, and they also receive the liquor which is left in the bottom of the cistern in passing under the rollers. When they are sufficiently impregnated they are deposited by a folder in any suitable receiver and removed to a convenient place and allowed to age—that is to say, to oxidize the aniline. When the oxidation is completed the warps are passed into a cistern, P, (see Fig. 2,) and travel over and under the rollers J' in the cistern. Over the cistern is also fixed a tank, K', which is fitted with a similar apparatus to that hereinbefore described. In the tank K' is placed a solution of concentrated bichromate of potash acidulated with muriatic acid. The solution passes through the pipes and tube O', and falls in a shower on the warps, impregnating them with the solution. After this operation the cotton warps are dyed fast and unalterably black. They are then washed in cold water and with soap and dried in a heated room. The washing is done in a cistern having two compartments—one with soap and water and the other with cold water only. The cistern is of similar construction to that represented in Fig. 1; but I lay no claim to the cisterns, as they are well known. This last cistern is not fitted with a tank and apparatus.

Instead of employing the tube O, bored with holes, I may fit to the bottom end of the tap a pipe, which enters the cistern and extends nearly to the bottom of the cistern. The tap can be so regulated as to admit only a suffi-

cient quantity of dye-mixtures equal, or nearly equal, to what the warps will imbibe in passing through the cistern, so that the mixtures are kept in an equal, or nearly equal, degree of concentration. The bottom of the cisterns can also be made curved to give an easy flow to the liquids, which only enter the cistern in a limited quantity; and to keep a very low level in the cistern a hole, Q, is made on one of the sides of the cistern, in which is fitted a plug or tap, and through which, when open, any excess of liquids or mixtures escape, thus keeping a level of liquid an inch or two in the cistern, so that the warps passing under the bottom rollers may imbibe the mixture or liquor.

In mordant and dye cotton goods aniline-black in the same manner as the warps. The goods passing through the cisterns receive a shower of the dyeing materials and of a solution of concentrated bichromate of potash and muriatic acid.

Having thus described my invention and the best means I am acquainted with for carrying the same into effect, I would have it understood that I do not confine myself to the exact proportions given, as they may be varied without departing from the peculiar character of the invention; but

What I do claim is—

The herein-described method of dyeing cotton warps or cotton fabrics, consisting in first showering the same with a mixture composed of water, a solution of chloride of iron, aniline-oil, muriatic acid, chlorate of potash, and sulphate of copper, in the proportions substantially as set forth, then passing these warps or fabrics through the same mixture, and then, after aging them, to oxidize the aniline, showering them with a solution of concentrated bichromate of potash acidulated with muriatic acid, all as hereinbefore set forth.

JULES JOSEPH LELOIR.

Witnesses:

WALTER JAS. TURNER,
SAMUEL A. DRACUP.