

UNITED STATES PATENT OFFICE.

JOHN DICKSON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PLATES OR DIES FOR PRINTING.

Specification forming part of Letters Patent No. **154,230**, dated August 18, 1874; application filed July 9, 1874.

To all whom it may concern:

Be it known that I, JOHN DICKSON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Plates or Dies for Printing, of which the following is a specification:

My invention relates to certain improvements in plates or dies for printing, and the means of producing the same; and it consists of a hard-rubber plate or die, upon which the desired characters or designs in relief are produced directly from an etching or engraving upon stone, metal, wood, or other material, the characters or designs being formed in intaglio upon the engraved or etched plate or stone, so that they will be transferred in relief to the rubber die, as will be fully herein-after set forth.

In carrying out my invention I first etch the design in intaglio upon the stone or other material in the position in which it is to appear upon the paper when printed, and I produce the rubber plate or die directly from such etching or engraving by pressing the prepared rubber against the face of said engraving in a vulcanizing-flask, and vulcanizing it in the ordinary manner. Any material may be employed for the engraving, but I prefer to use the ordinary lithographic stone for the purpose. I cover the face of such a stone with lithographic ink, rosin, asphaltum, or other resists, and etch or scratch the characters or designs through the same by means of a sharp instrument, and then etch into the stone by means of nitric acid; or I employ lithographic ink, and stop out those portions of the stone which are to be in relief, and then etch around such stopped portions by means of nitric acid, as before. Instead of stone I may employ metal for the engraving or etching, in which case I prefer to use zinc for the purpose, and hydrochloric or muriatic acid, instead of the nitric acid employed in etching the stone. I sometimes make the etching in plaster-of-paris. In this case I mix the plaster with water, and pour it out upon a sheet or plate of glass. When set and hardened I remove the plaster, and engrave upon the smooth side. To avoid the necessity of cutting out the places to be left blank upon the rubber

plate or die, it is only necessary to stop out the blank spaces of the engraving by means of plaster, or its equivalent. This stopping out is done by simply covering the blank parts with plaster-of-paris, or its equivalent, to the thickness desired, the portions so covered forming depressions in the finished rubber plate, as will be readily understood. The engraving or etching being properly prepared, it is covered with wax of the thickness desired in the finished plate or die, interposing a sheet of paper between the engraving and the wax, to prevent the wax from filling the lines of said engraving. The engraved stone or plate, covered with the wax as described, is then placed in one half of an ordinary vulcanizing-flask, and plaster is poured or filled in around it to the top of the wax which covers it. The other portion of the flask is then placed in position and properly filled with plaster, and after the whole is properly set and hardened, the two parts of the flask may be separated and the wax removed. The space it occupied is then filled with prepared rubber—that is, rubber and sulphur. I find that the ordinary rubber prepared for dental use admirably answers the purpose. Sufficient rubber is placed in the flask to require considerable pressure in closing it, so as to force the rubber well into the lines of the engraving or etching. The flask is then securely closed and placed in a vulcanizer and subjected to heat, in order to vulcanize the rubber, as will be readily understood by those skilled in the art of working rubber. After being subjected to heat for a proper length of time—say about one hour and a quarter—I remove the flask and allow it to cool, after which I remove the rubber plate, which will be vulcanized, and will have a perfect impression of the design or engraving upon its face. If the lines should be uneven, owing to variations in the depth of the engraved lines of the stone, &c., the face of the rubber plate or die may be smoothed down with pumice-stone or its equivalent.

If it is desired to back the rubber plate with wood, metal, or other material, it may be done by simply attaching the plate to the same by means of screws or nails; or it may be done during the process of vulcanization in the

flask, by driving nails or tacks into the face of the wood, allowing the heads to project slightly, and setting the block in the half of the flask opposite the engraving, so that the heads will be embedded in the rubber, and in the case of metal, by perforating it, and placing it similarly in the flask.

Plates for cylinder-presses may be thus formed with metal backing. For this purpose the rubber is not vulcanized quite so hard, so that the plate may be bent to the required form.

Having thus described my invention, what I claim is—

1. The improved process of producing characters in relief upon hard-rubber plates or dies directly from an intaglio design upon stone, wood, or metals, as herein described.

2. A hard-rubber plate or die for printing from, produced substantially in the manner hereinbefore described.

In testimony that I claim the foregoing I have hereunto set my hand.

JOHN DICKSON.

Witnesses:

A. H. SHOEMAKER,
JOHN COX.