

No. 628,587.

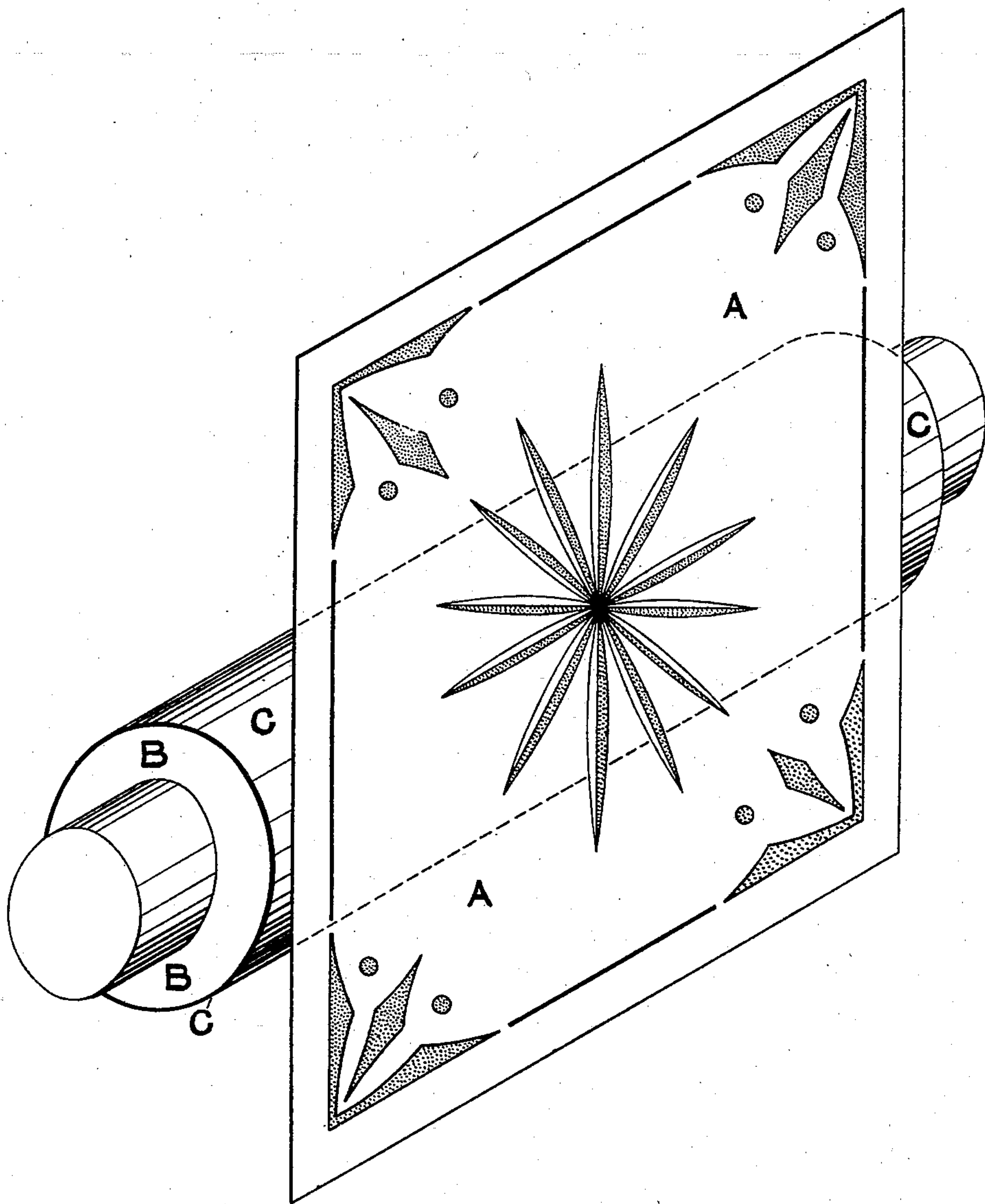
Patented July 11, 1899.

H. LYON.

ETCHING CYLINDRICAL SURFACES.

(Application filed Sept. 4, 1897.)

(No Model.)



WITNESSES.

E. Howard.
Joseph Bates

INVENTOR

Henry Lyon
by Wm. Thompson & Co.
attys.

UNITED STATES PATENT OFFICE.

HENRY LYON, OF MANCHESTER, ENGLAND.

ETCHING CYLINDRICAL SURFACES.

SPECIFICATION forming part of Letters Patent No. 628,587, dated July 11, 1899.

Application filed September 4, 1897. Serial No. 650,688. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY LYON, a subject of the Queen of Great Britain, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in the Engraving of the Cylindrical Surfaces of Rollers, Dies, or Mills, (for which I have obtained British Letters Patent No. 24,788, dated November 5, 1896, and French Letters Patent No. 270,009, dated August 28, 1897,) of which the following is a specification.

This invention relates to improvements in the method of producing intaglio or relief (surface) engravings on copper, steel, or other metal rollers for printing or embossing calico, paper-pulp, leather, velvets, or other fabrics or material and also for producing such engravings on engravers' cylindrical steel dies and mills.

The object of the invention is to produce all such engravings in an expeditious manner and without the use or employment of photo or other lithographic or other inked transfers or of any machine or machinery whatsoever.

Hitherto in order to etch or engrave a pattern upon a curved or cylindrical surface it has been necessary to produce a lithographic copy of such, prepared with sticky or greasy ink known as a "lithographic transfer," and by pressure or other mechanical means transfer an impression in ink therefrom to the curved or cylindrical surface of the roller or die, the ink in this case on the roller or die acting as a resist to the acid, whereas by my process I am enabled to photograph the design direct onto the curved or cylindrical surface.

The drawing illustrates a small roller or die with the transparency before being attached thereto.

In carrying my invention into effect I first draw or paint by hand or otherwise produce a copy of the design to be engraved upon a sheet A of transparent gelatin or other suitable flexible transparent support, such drawing or painting being made to the exact circumference of the roller or cylindrical die B it is to be engraved upon, and the design so drawn and arranged that when placed and fixed in position around the roller or die B such design or drawing will match and fit up

to form a continuous printing-pattern, or instead of producing such drawings by hand I may make a photographic film, negative or positive, of the drawing to be engraved. I spread over the entire curved surface of the roller or cylindrical die B a viscous solution C, of gelatin or glue or albumen or a combination of same, or of other suitable colloid body sensitized with ammonium bichromate or other chromate, or may use a sensitized solution of bitumen or asphalt for this purpose, which I then allow to dry. When dry, I attach the above-described flexible negative or transparency A direct onto the coated periphery of the roller or cylindrical die B, which I then subject to the action of light. By this means I obtain a photographic print of the drawing or design to be engraved direct onto the sensitized periphery of the said roller or die. After sufficient exposure I remove the transparency or negative A and proceed to develop the photographic print on the roller or die B by the application of water or turpentine or other suitable means, according to the colloid I have used, in order to remove those parts which have been protected from light by the dark or opaque parts of the transparency and which have to be engraved on the metal roller or die. When this operation is completed, I proceed to strengthen or harden the resist C, forming the pattern on the roller or die, in order to confer full resisting power on it to the etching fluid used in the subsequent operation, and for this purpose I apply strong heat to the roller or die at a temperature of about 500° to 550° Fahrenheit, thereby producing on the surface of the roller a hard enamel perfectly acid-resisting. After this operation I etch the roller or die in a bath of dilute nitric acid, solution of ferric chlorid, or other suitable etching mordant, after which operation the resist is cleaned off the roller or die, and it is then ready for the purposes it may be intended for.

The essential features of the invention consist in producing direct upon the curved or cylindrical surface of a roller or die B a photographic image of the design without the aid of photolithographic or any other ink transfers or the use of any machine or machinery or mechanical process whatever for the purpose in the manner described.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. The method or process of engraving the cylindrical surfaces of metal rollers and engravers' cylindrical steel dies which consists in covering the cylindrical surface with a sensitized colloid attaching thereto a flexible transparent medium (having a copy of the design) of the exact size of the circumference of the roller to form a continuous pattern through which the design is photographed direct onto the sensitized surface of the cylindrical roller, developing the same in water to remove the soluble portion of the colloid unacted upon by light, thereby forming a resist hardening the colloid surface upon the roller by intense heat to withstand the action of acid and then etching the exposed parts of the surface by the action of acid, substantially as described.

2. The method or process of engraving the

cylindrical surfaces of rollers, mills and dies which consists in spreading a coating of sensitized colloid direct upon the periphery thereof, attaching a flexible transparent medium—carrying a copy of the design—of the exact size of the periphery of the roller to form a continuous pattern, photographing the design direct onto the periphery, washing away the unexposed parts of the surface, hardening the remaining surface by heating to about 500° Fahrenheit and subsequently etching the unprotected parts of the periphery by the action of acid, substantially as described.

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

HENRY LYON.

Witnesses:

J. OWDEN O'BRIEN,
HARRY BARNFATHER.