

J. T. RAWSTHORNE.  
 ENGRAVING OR PREPARATION OF STEEL DIES OR ROLLERS.  
 APPLICATION FILED OCT. 7, 1907.

991,747.

Patented May 9, 1911.

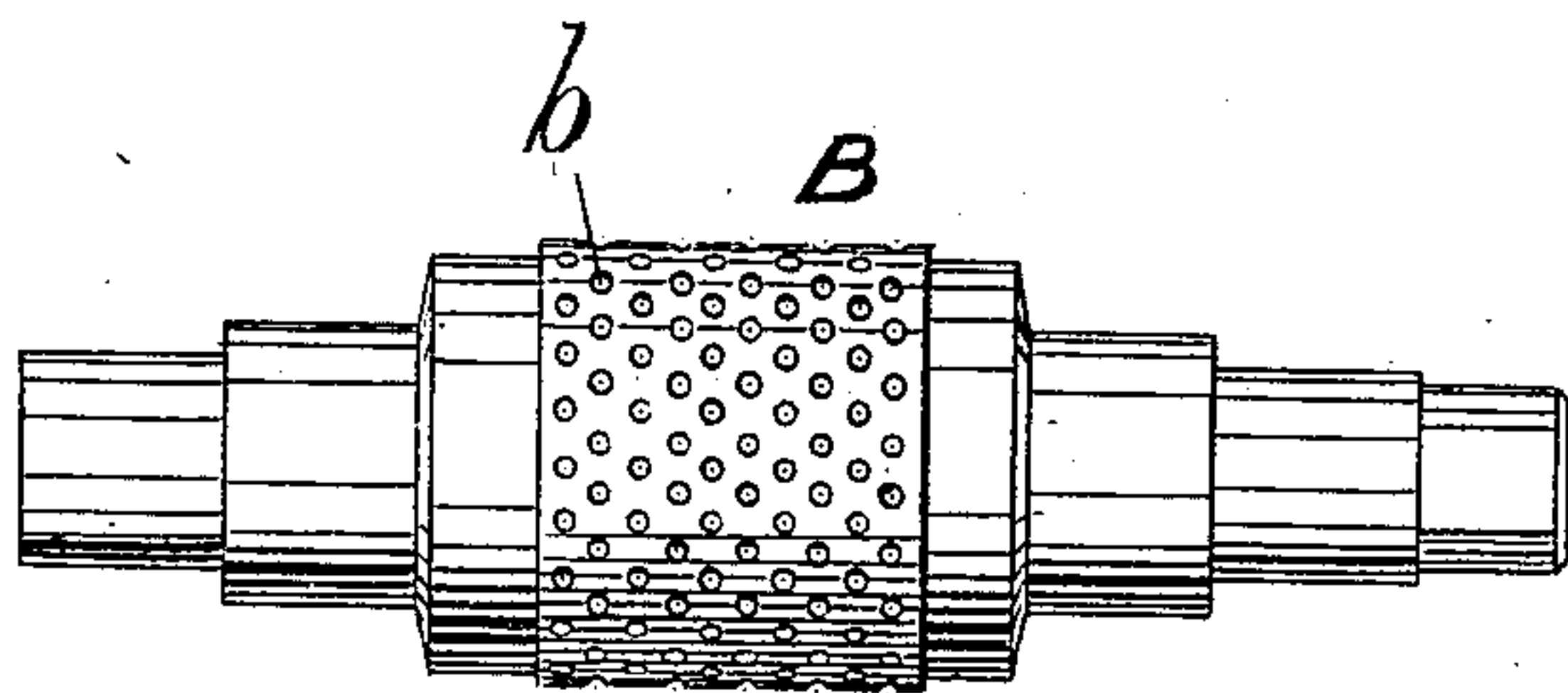


FIG. 1.

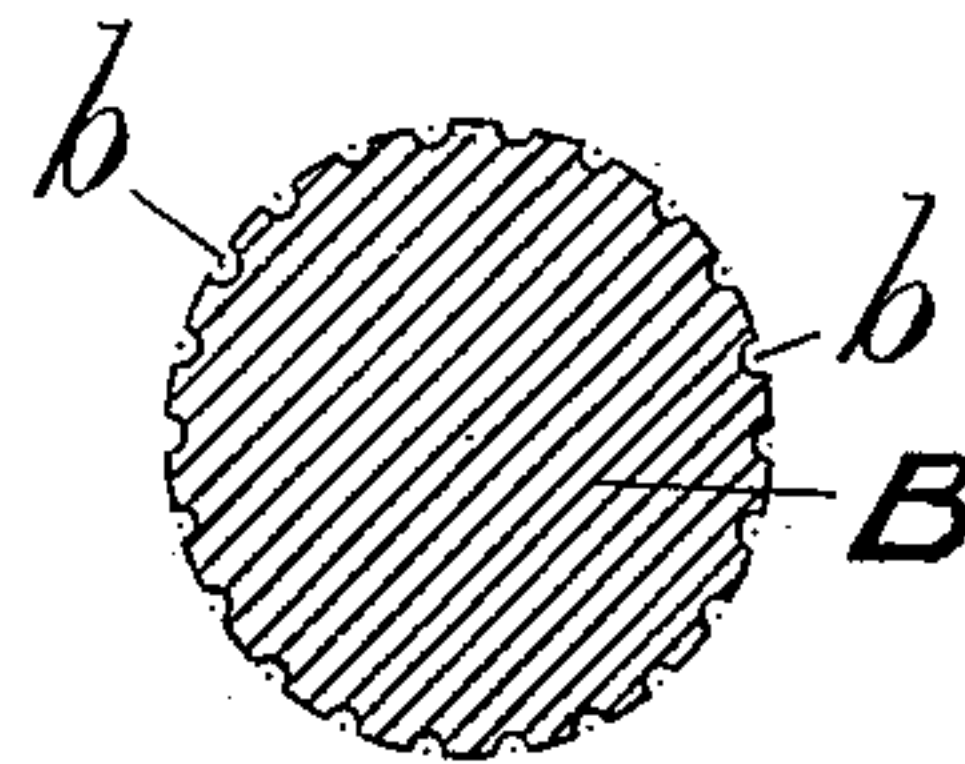


FIG. 2.

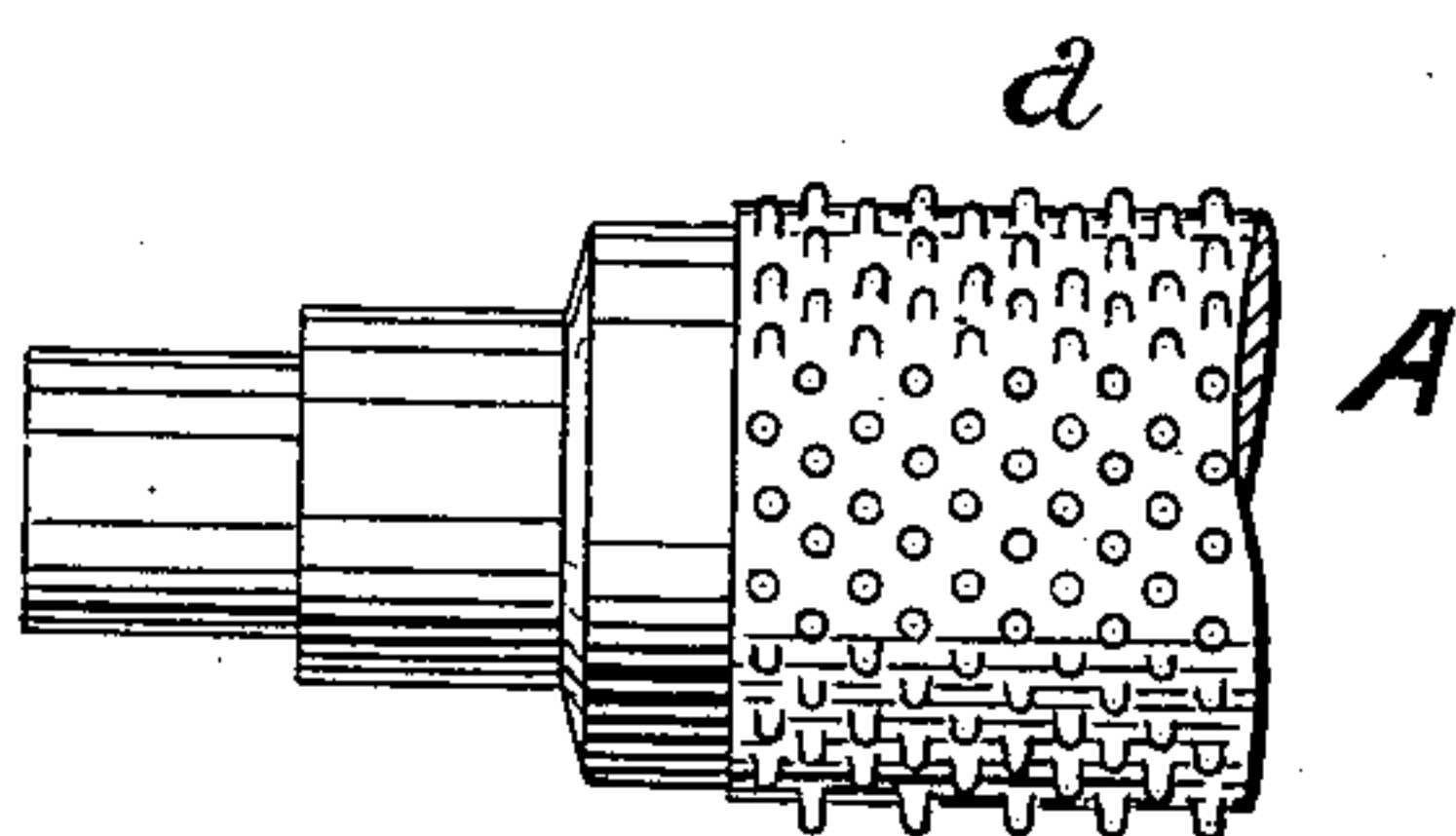


FIG. 3.

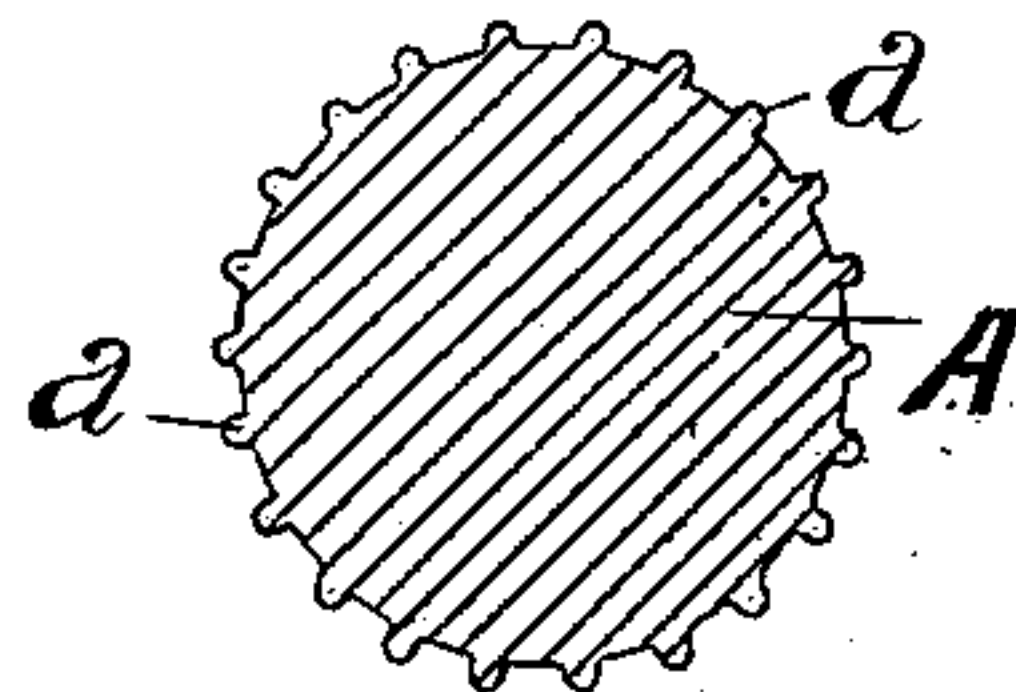


FIG. 4.

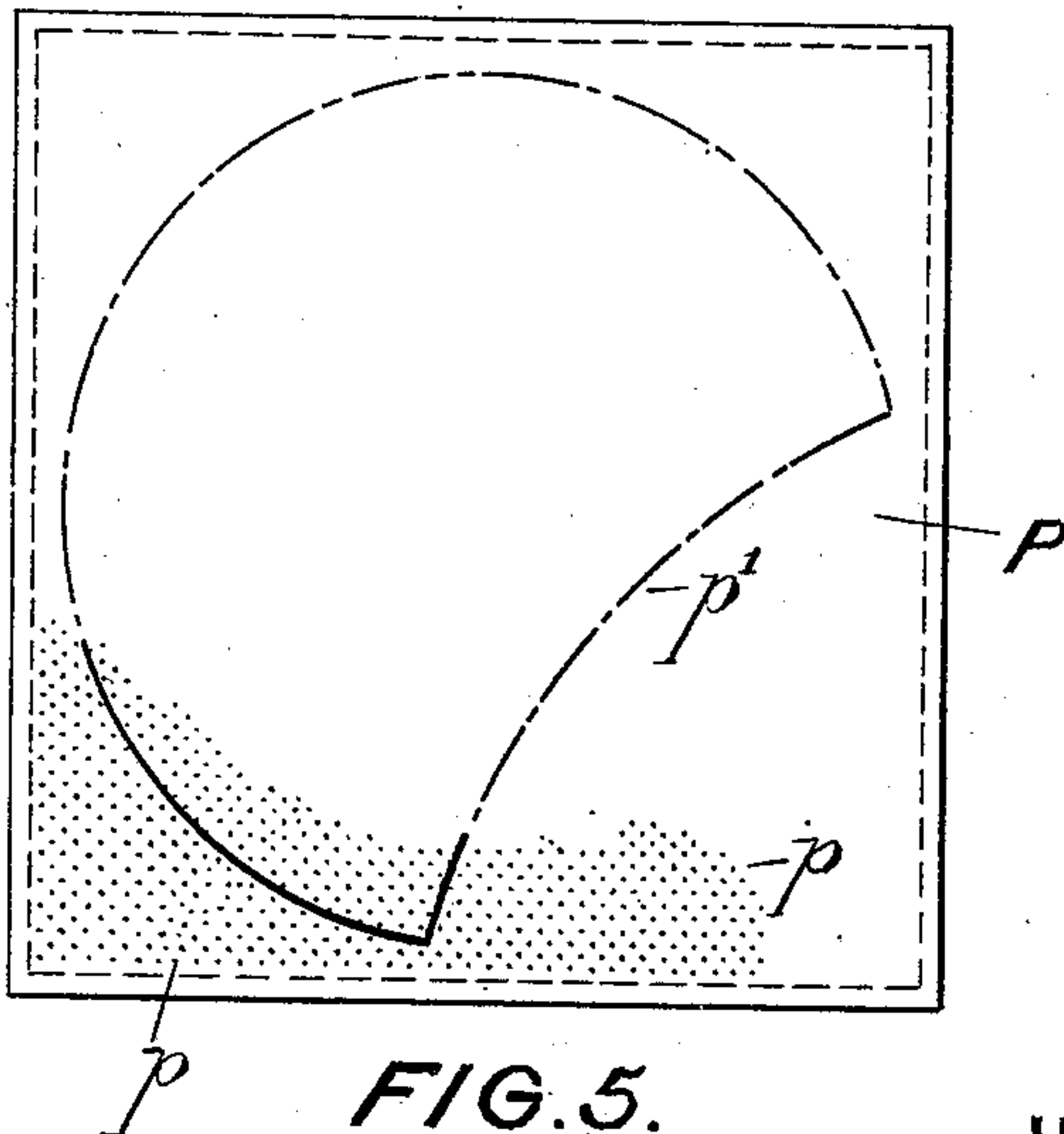


FIG. 5.

WITNESSES.

Joseph Bates.  
 Howard

INVENTOR.

J. T. Rawsthorne  
 by J. O. S. S. S. S. S.  
 atty.



# UNITED STATES PATENT OFFICE.

JOSEPH TWEEDALE RAWSTHORNE, OF DINTING, ENGLAND.

ENGRAVING OR PREPARATION OF STEEL DIES OR ROLLERS.

991,747.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed October 7, 1907. Serial No. 396,343.

*To all whom it may concern:*

Be it known that I, JOSEPH TWEEDALE RAWSTHORNE, British subject, and resident of Dinting, county of Derby, England, have  
5 invented certain new and useful Improvements in the Engraving or Preparation of Steel Dies or Rollers, of which the following is a specification.

The invention relates to the engraving or  
10 preparation of the steel dies employed in the engraving of copper printing rollers such as used for calico printing or other metal cylinders or rollers in which the gradations of shade in the pattern are obtained from  
15 dots indentations or depressions in the surface of the roller.

Hitherto for the production of such style of shading the dies have chiefly been prepared by hand work and where pentagraph  
20 machines have been employed for the purpose the pattern has been prepared on a plate by punching thereon by hand the indented dots comprising the pattern.

The invention will be fully described by  
25 reference to the accompanying drawings.

Figure 1. is a side elevation of die with a number of indents over its surface. Fig. 2. is a section of same. Fig. 3 is an embossed roller or mill A with points or pins  
30 projecting from its surface. Fig. 4. is a section of same. Fig. 5. is an embossed pattern plate P.

In carrying out the invention I prepare a  
35 plate P which I term an embossed pattern plate over the entire surface of which are indented a number of fine dots, indentations depressions or recesses  $p$ . This plate is preferably zinc though it may be made of other metal or material capable of receiving and  
40 retaining such impressions. The indentations or depressions  $p$  upon the surface of the embossed pattern plate P are arranged geometrically to correspond with the indentations or depressions required to be produced upon the surface of the steel die but  
45 are arranged to a considerably greater scale, that is to say, that while the indentations on the plate may be as fine and small as possible their distance apart is say  $2\frac{1}{2}$  to 10 times  
50 greater than those required on the steel die. Upon the embossed pattern plate after the indentations are made the outline  $p'$  of the pattern is traced.

Indented pattern plates have been produced in several ways:—(a.) By setting out  
55 the position of each indentation geometri-

cally or otherwise and punching by hand. (b.) By transferring from a paper or other pattern and then punching by hand. (c.) By photographing from a screen or pattern  
60 on to the plate and then etching the indentations thereon.

The method I at present prefer to adopt after experimenting with all of the above methods is to prepare a steel mill or roller  
65 A having embossed over the surface a number of points or pins  $a$  corresponding to the indentations or depressions  $p$  required upon the embossed pattern plate P and then indenting the plate P over its whole surface by  
70 passing it between this embossed mill and another roller using sufficient pressure to emboss the pattern plate with the indentations. The embossed steel mill is prepared from a die B Fig. 1 with indentations  $b$   
75 punched therein by hand. The mill A can be employed again and again to prepare any desired number of embossed pattern plates. The pattern plate so prepared with the indentations over its whole surface has then  
80 an outline of the pattern  $p'$  traced over the indentations  $p$ . In use it is placed upon the table of a pentagraph engraving machine and the indentations thereon are reproduced in a proportionately reduced scale upon a  
85 steel die or metal cylinder by means of a punch such as described in the specification of Barr's Patent No. 824088 of 1906. The die or metal cylinder is mounted upon a carriage at the back of the machine under the  
90 punch.

The operator moves the pointer of the machine over the embossed pattern plate inserting it in each indentation or depression  
95 thereon within the traced pattern and then treadles or releases the punch which falls upon the die or cylinder making an indent therein. The punch is provided with an adjustable weight and it may be operated a second time. The die or cylinder is preferably punched first and the outline of the  
100 pattern engraved upon it afterward though the outline may be first engraved and the punching then be done. The steel die is employed in the ordinary way to form a mill  
105 from which the copper printing roller is embossed or engraved.

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

The process of preparing or producing an  
110 embossed pattern plate for use in a pentagraph machine for engraving steel dies em-

ployed in the preparation of copper printing rollers, consisting in impressing mechanically over its entire surface a plurality of geometrically arranged dots and subsequently engraving the outlines of any pattern over and among such dots.

In witness whereof, I have hereunto signed

my name in the presence of two subscribing witnesses.

JOSEPH TWEEDALE RAWSTHORNE.

Witnesses:

J. OWDEN O'BRIEN,

B. TATHAM WOODHEAD.

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