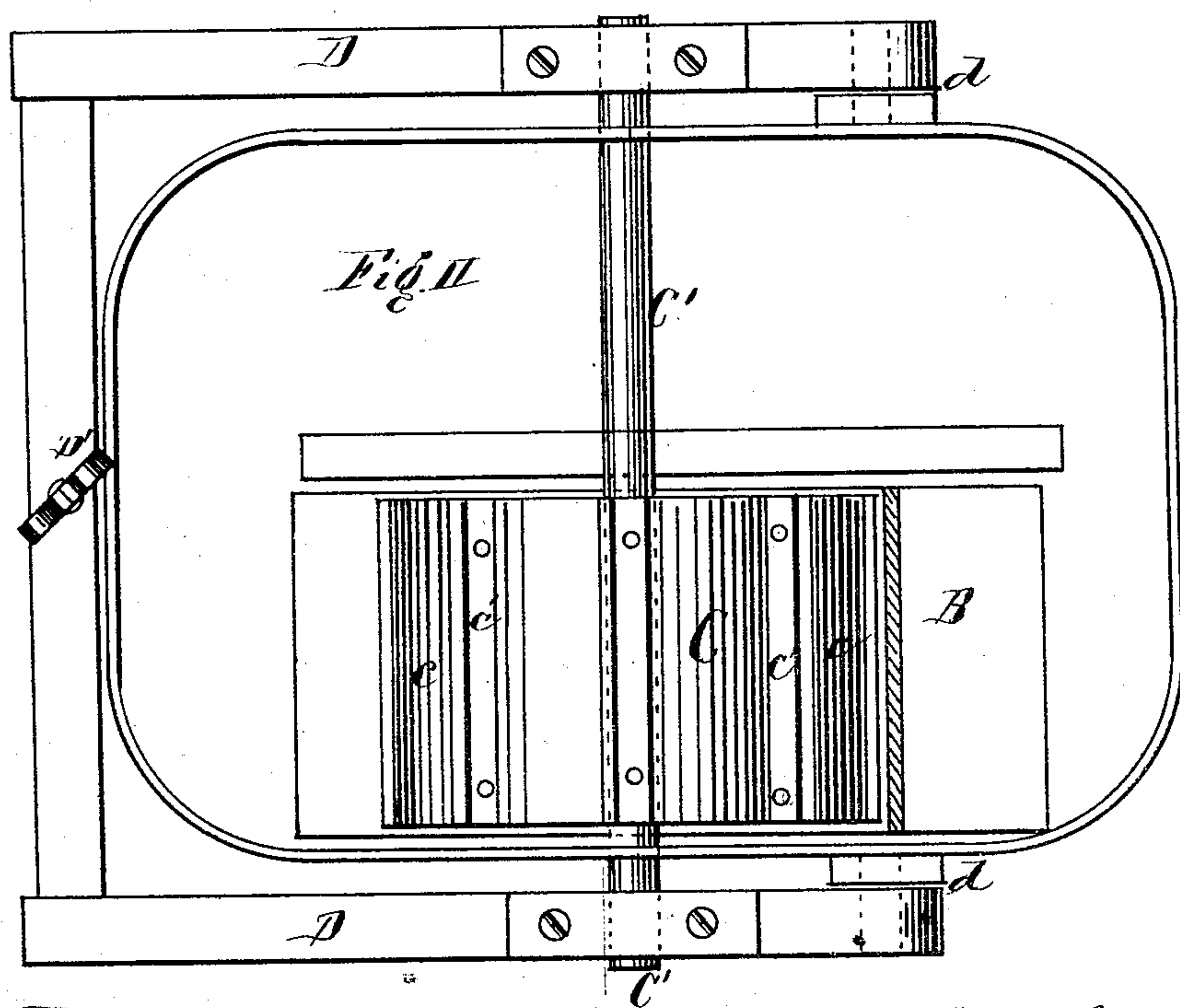
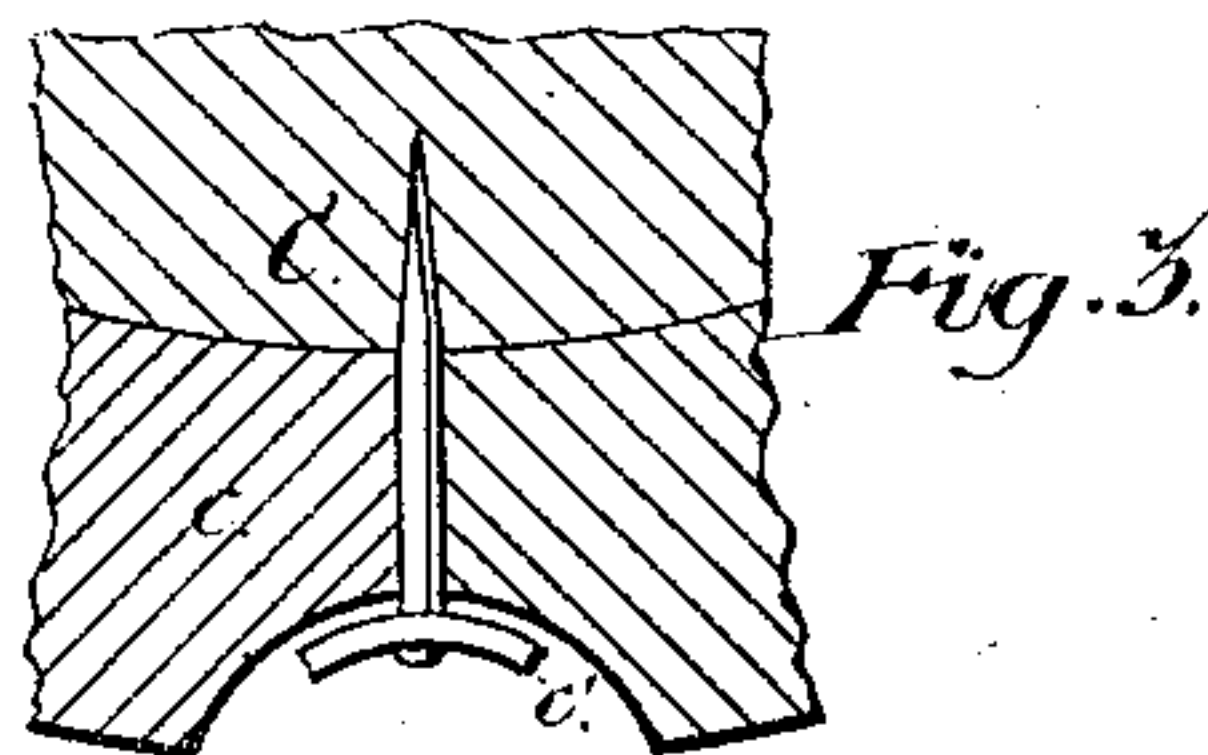
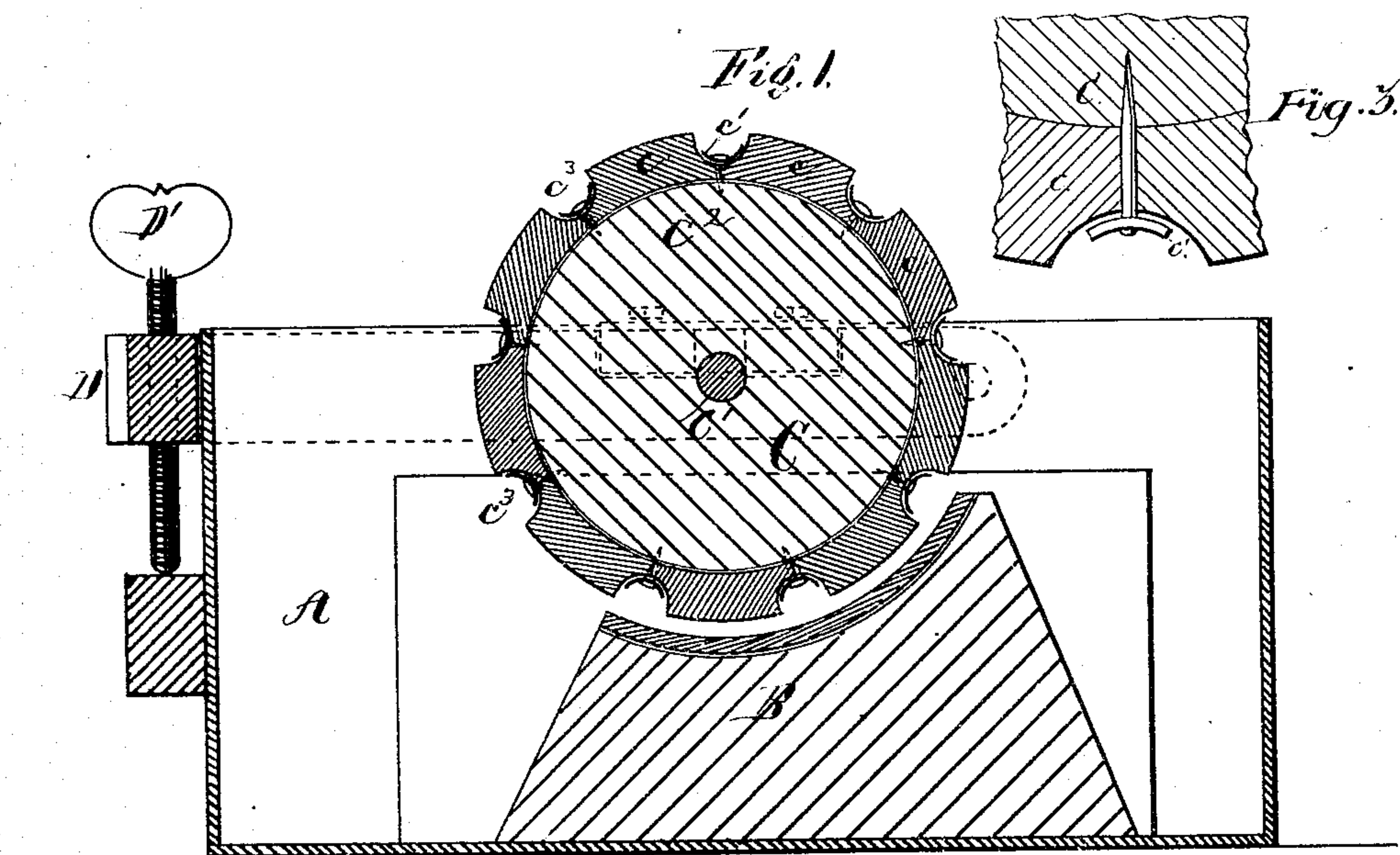


F. A. CUSHMAN.  
Paper-Pulp Engine.

No. 163,638.

Patented May 25, 1875.



Witnesses:  
Franklin Barnitt  
Richard Gerner.

Inventor:  
Francis A. Cushman.  
Per: Henry Gerner, atty.



# UNITED STATES PATENT OFFICE.

FRANCIS A. CUSHMAN, OF LEBANON, NEW HAMPSHIRE.

## IMPROVEMENT IN PAPER-PULP ENGINES.

Specification forming part of Letters Patent No. **163,638**, dated May 25, 1875; application filed April 21, 1875.

*To all whom it may concern :*

Be it known that I, FRANCIS A. CUSHMAN, of Lebanon, in the county of Grafton and State of New Hampshire, have invented a new and useful Improvement in Paper-Pulp Engines; and I do hereby declare the following to be a full and clear description of the same, which will enable others to make and use my improved mills.

This invention relates to a machine for reducing to pulp such articles as wood, straw, leather, chips, &c., preparatory to the manufacture of paper or other similar articles.

The invention consists in the production of a concave bed of natural or artificial stone, emery, quartz, or corundum, and a rotating wheel of the same material, the rotating wheel or engine having transverse grooves to facilitate the pulping operation, and having a vertical adjustment also, being constructed in a peculiar manner, being built of artificially-formed material.

The invention will be readily understood by reference to the accompanying drawings, of which—

Figure I is a sectional elevation of the improved mill. Fig. II is a plan of the same; Fig. III, a section of fastening device.

The pit or tank A, in which the pulping operation is performed, contains a grinding-bed, B, the top or grinding surface of which is concave, and fitted to the periphery of the grinding wheel or engine C, which is mounted on a central shaft or axle, C', by means of which a rotary motion is given to the said wheel C. The bed B and the wheel or engine C may be made of solid natural stone, as burr, granite; or they may be formed of pulverized quartz, emery, or corundum, constructed by artificial means into the form required. The axle C' has its bearings in the adjustable frame D, one end of which is pivoted at *d*, and the other end supported on the adjusting-screw D', by

which it is raised or lowered, so as to increase or diminish the distance between B and C, and thereby regulate the fineness of the pulp produced.

If formed of artificially-constructed material, the wheel C will be built of segments *c*, having their contiguous exterior angles concaved out, so as to receive the joining-plates *c*<sup>1</sup>. These joining-plates are to be bolted, screwed, or otherwise securely fastened to the interior drum *c*<sup>2</sup>, which may be built of either wood or metal, and by their united action will hold the annular rim, composed of the segments *c*, to the interior drum. These concaved angles of the segments will form grooves *c*<sup>3</sup>, running transversely across the face of the wheel, and these grooves must be cut in the face of the wheel if a solid stone is used, as they are necessary to facilitate the grinding operation.

By reference to Fig. I it will be seen that the bed-piece B forms about one-quarter of a circle, the bottom end of which is tangent to the bottom of the tank A, and as the wheel C revolves so as to carry the material from the bottom of the tank onto this bottom part of the bed-piece, the access of the material to be pulped to the bed will be easy.

Having thus described my invention, I desire to claim—

1. The stone-faced grinding-cylinder, having longitudinal grooves in its surface, in combination with the concave stone bed-plate, substantially as described.

2. The grinding-wheel C, when constructed of separate sections or segments *c*, and attached to the periphery of an interior drum of wood or metal by means of the joining-plates *c*<sup>1</sup>, substantially as described and set forth.

FRANCIS A. CUSHMAN.

Witnesses:

RICHARD GERNER,  
FRANKLIN BARRITT.