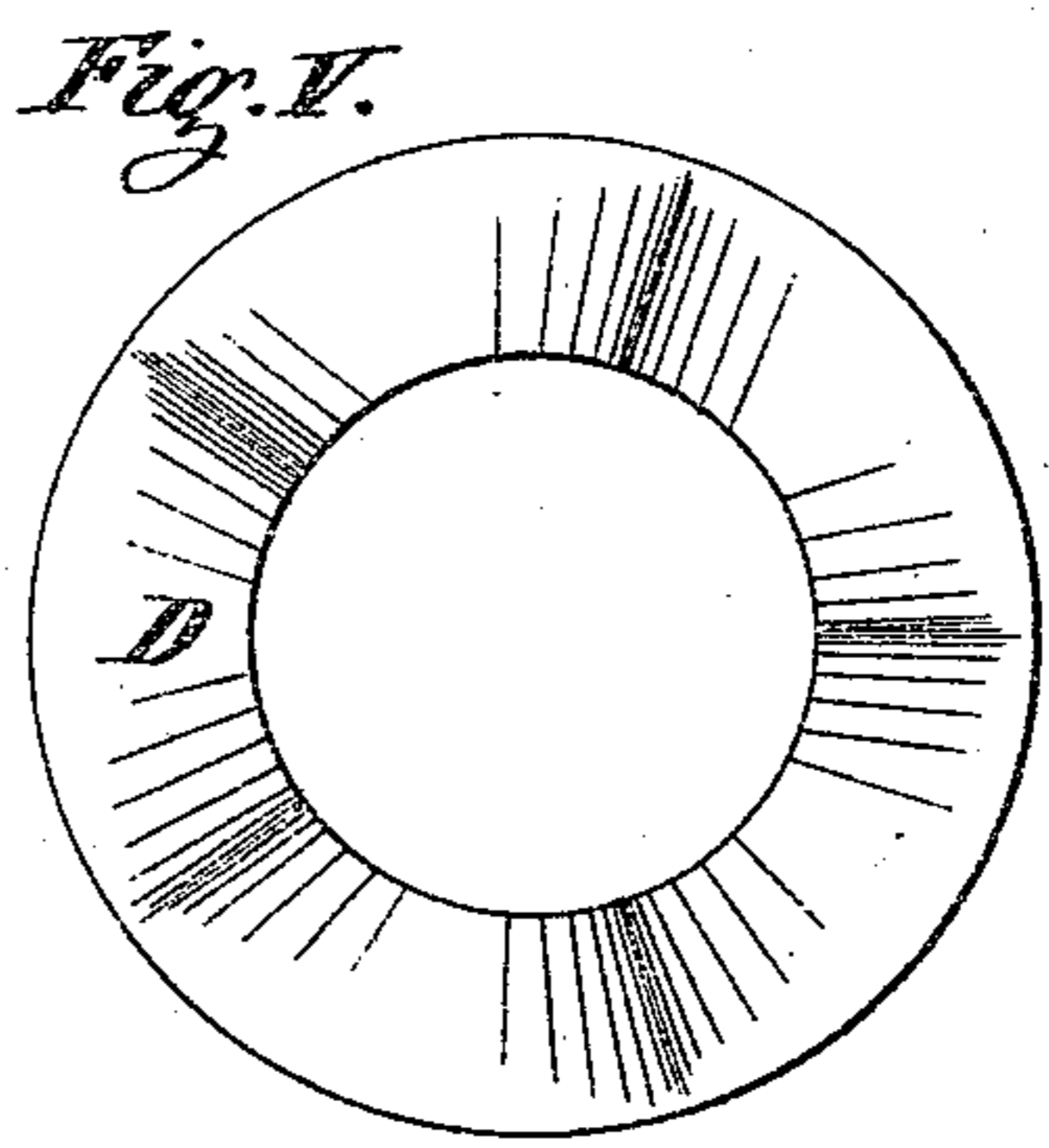
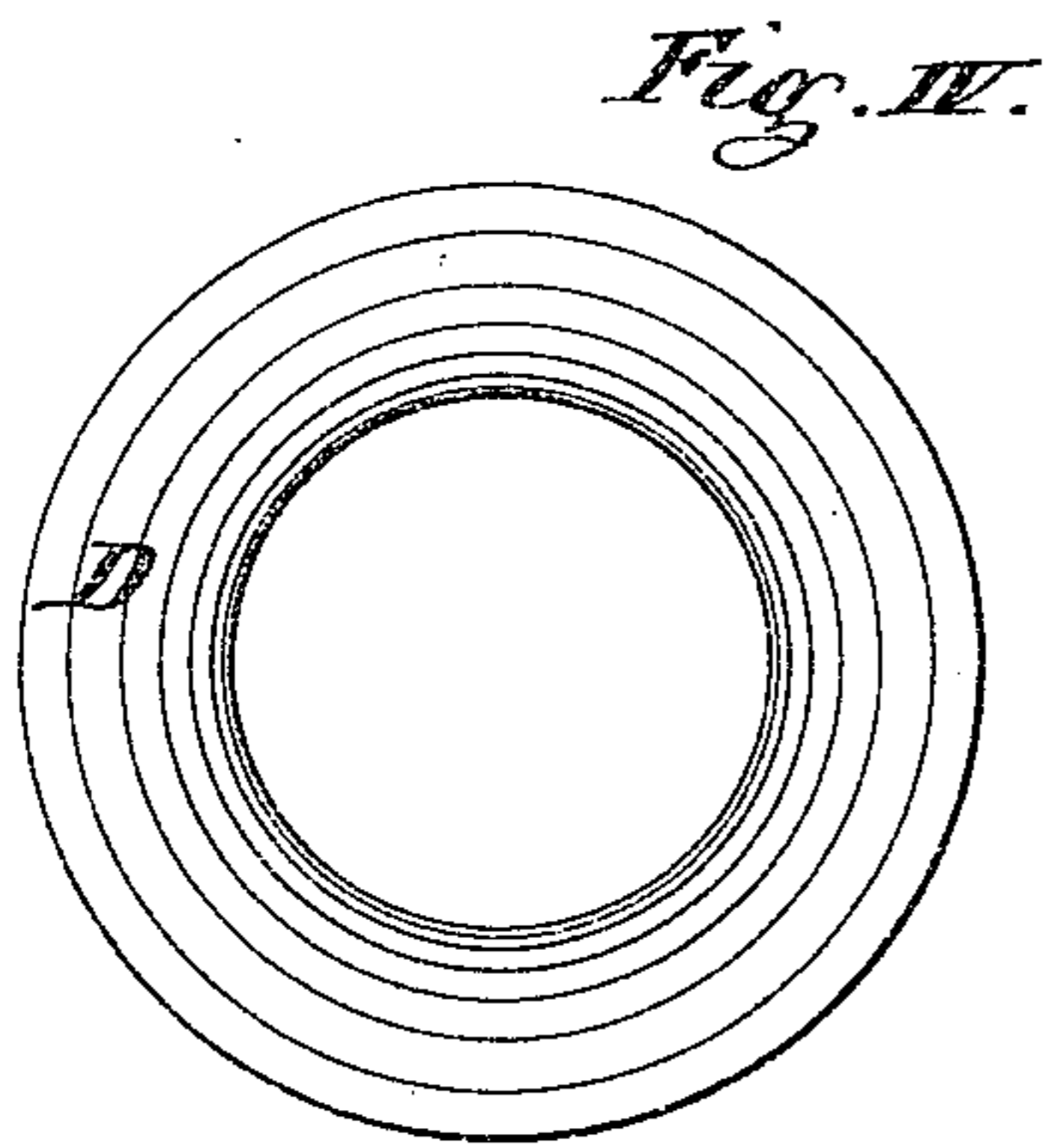
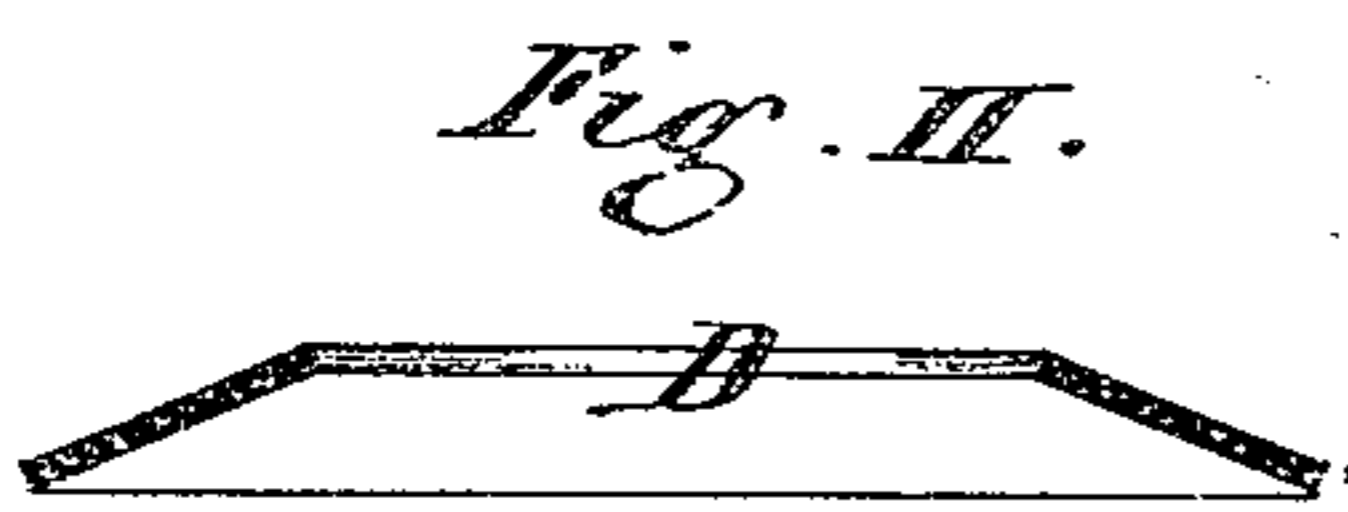
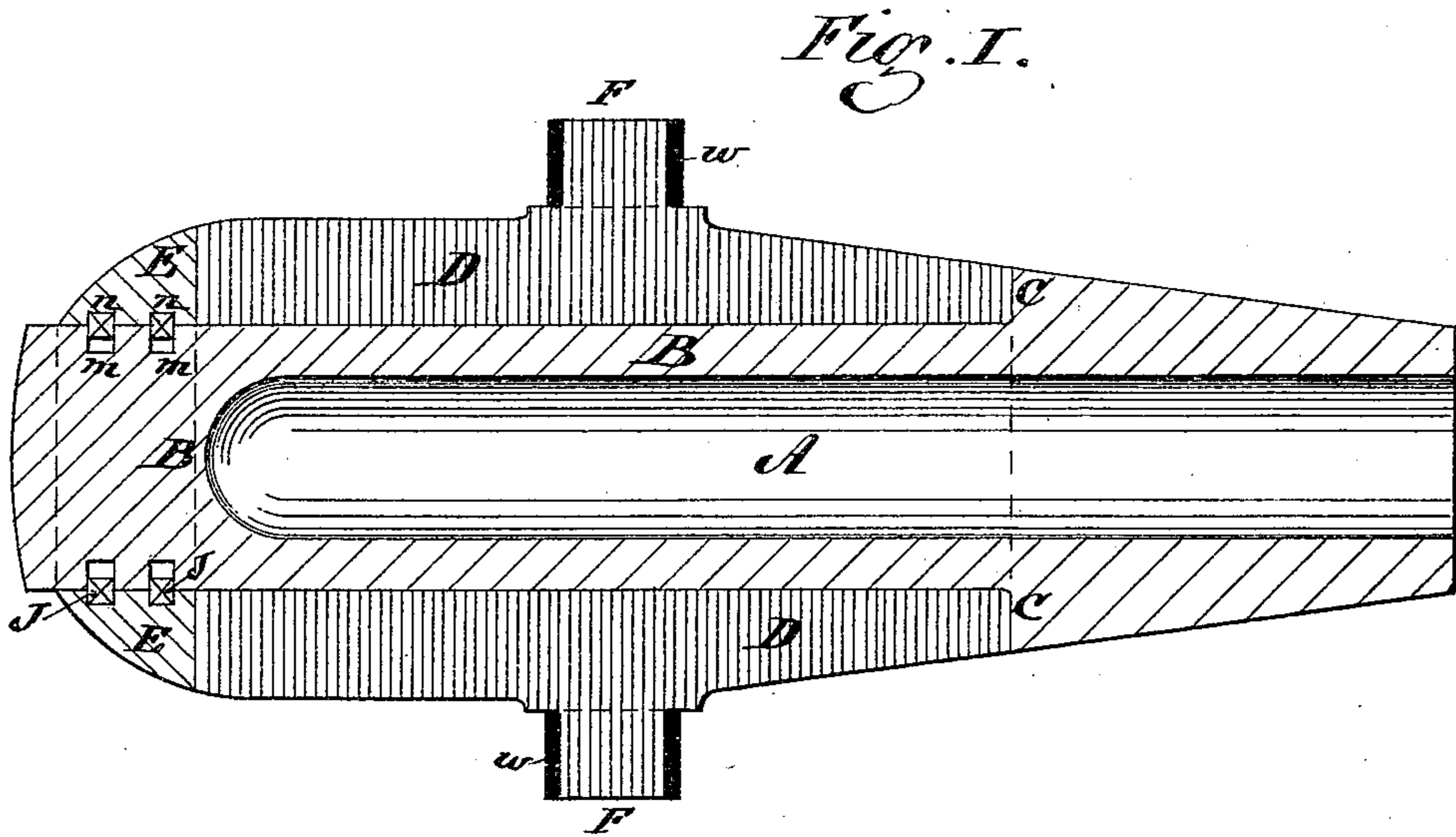


J. F. ALLEN.

Processes for Making Strengthening-Rings for Cannon.

No. 153,294.

Patented July 21, 1874.



Witnesses.

A E Collins
John Surdane

Inventor

John F. Allen
per Henry E. Roder
Attorney.

UNITED STATES PATENT OFFICE.

JOHN F. ALLEN, OF NEW YORK, N. Y.

IMPROVEMENT IN PROCESSES FOR MAKING STRENGTHENING-RINGS FOR CANNON.

Specification forming part of Letters Patent No. **153,294**, dated July 21, 1874; application filed January 6, 1874.

To all whom it may concern:

Be it known that I, JOHN F. ALLEN, of New York, in the State of New York, have invented a new and Improved Mode of Strengthening Cannons and other cylinders, of which the following is a specification:

The nature of my invention consists in forging, rolling, or casting thin metallic rings or plates, either conical or with radiating corrugations, and then pressing these rings or plates straight when cold, so that the strain arising from any pressure, acting against the inner circumference, will be more equally distributed between the inner and outer circumference.

In the accompanying drawing, Figure I represents a section of a cannon strengthened by rings made in accordance with my improved mode. Figs. II, III, IV, and V represent sections and plans of the rings or plates referred to in the specification.

A represents the central core of the gun turned cylindrical on its after part B and increased in thickness at its forward end to any desired strength, and forming a collar at C for the strengthening-plates to abut against. Upon the after cylindrical part B, where it is desired to strengthen the gun, steel plates or disks D are forced by hydraulic or other pressure, which said disks or plates are securely kept in place by a ring, E. The disks or plates D, and which form the principal part of my invention, are rolled, cast, or forged in the shape of conical disks, as represented in section in Fig. II, or the same may be corrugated, as represented in section and plan in Figs. III and V, the corrugations being largest at the central hole, and radiating and gradually diminishing in size toward the outer circumference of the disk. These rings or plates are made with a central hole about as large as the outer diameter of the turned part B of the gun, and not more than one-half or three-quarters of an inch in thickness. When these rings or plates are cold they are, by means of pressure, forced into straight flat rings or plates of an even thickness. The central hole in each plate is then bored out the proper size

and forced upon the cylindrical turned part B perfectly tight against each other, and then securely locked in their places by means of the ring E. In the inner circumference of the ring E grooves *n n* are turned, and corresponding grooves *m m* are turned in the after part of the circumference of the part B. Into these grooves *m m* rings J J, similar to piston-packing rings, are sprung and then compressed to allow the ring E to pass over the same until said ring E has been forced on so far that the grooves *n n* in its inner surface correspond exactly with the grooves *m m* containing the spring-rings J J, when these latter will expand and enter said grooves *n n* in the ring E, as represented in the drawing, and thereby hold said ring E perfectly secure in its place. When all the rings or plates D, and ring E, are in their places and firmly fastened, the outside of the cylinder or cannon can be turned in the usual manner in any desired shape. When this mode of strengthening is used for cannons, the disks or plates D, which are situated in the line of the trunnions, can be forged with projections on the outer circumference, from which the trunnions F can be turned, and afterward covered by a steel cap or ring, *w*, to obtain a smooth bearing.

I do not claim strengthening cylinders or cannons by forcing or shrinking steel rings on their outer circumference, as this is old and well known; but

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

The herein-described mode of strengthening thin metallic rings, when intended for strengthening cannons or cylinders, by either forging, rolling, or casting them conical, disk-shaped, or with radial corrugations gradually diminishing toward their outer circumference, and then pressing the same straight and flat while in a cold state, substantially as set forth.

JOHN F. ALLEN.

Witnesses:

HENRY E. ROEDER,
J. B. NONES.