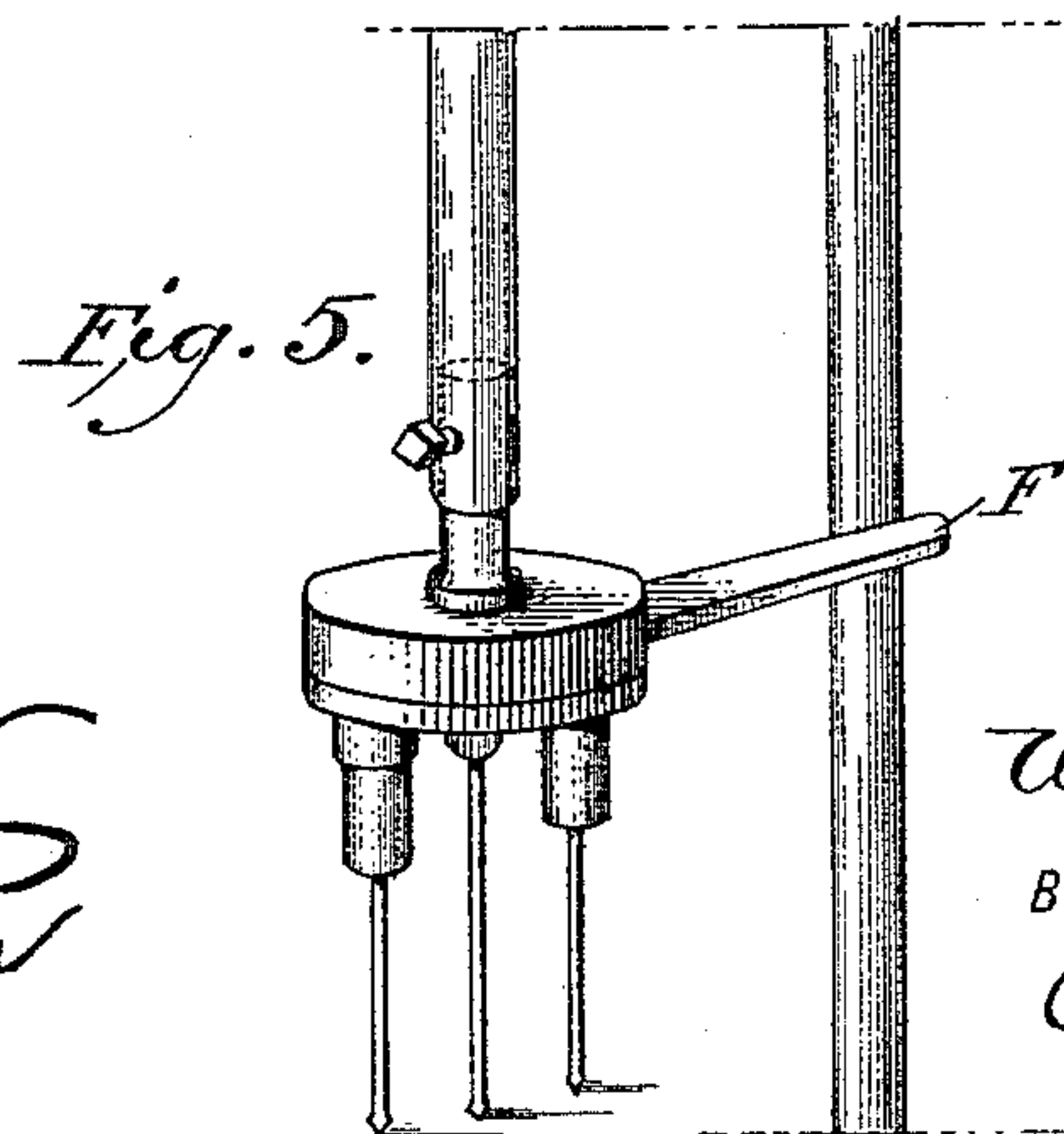
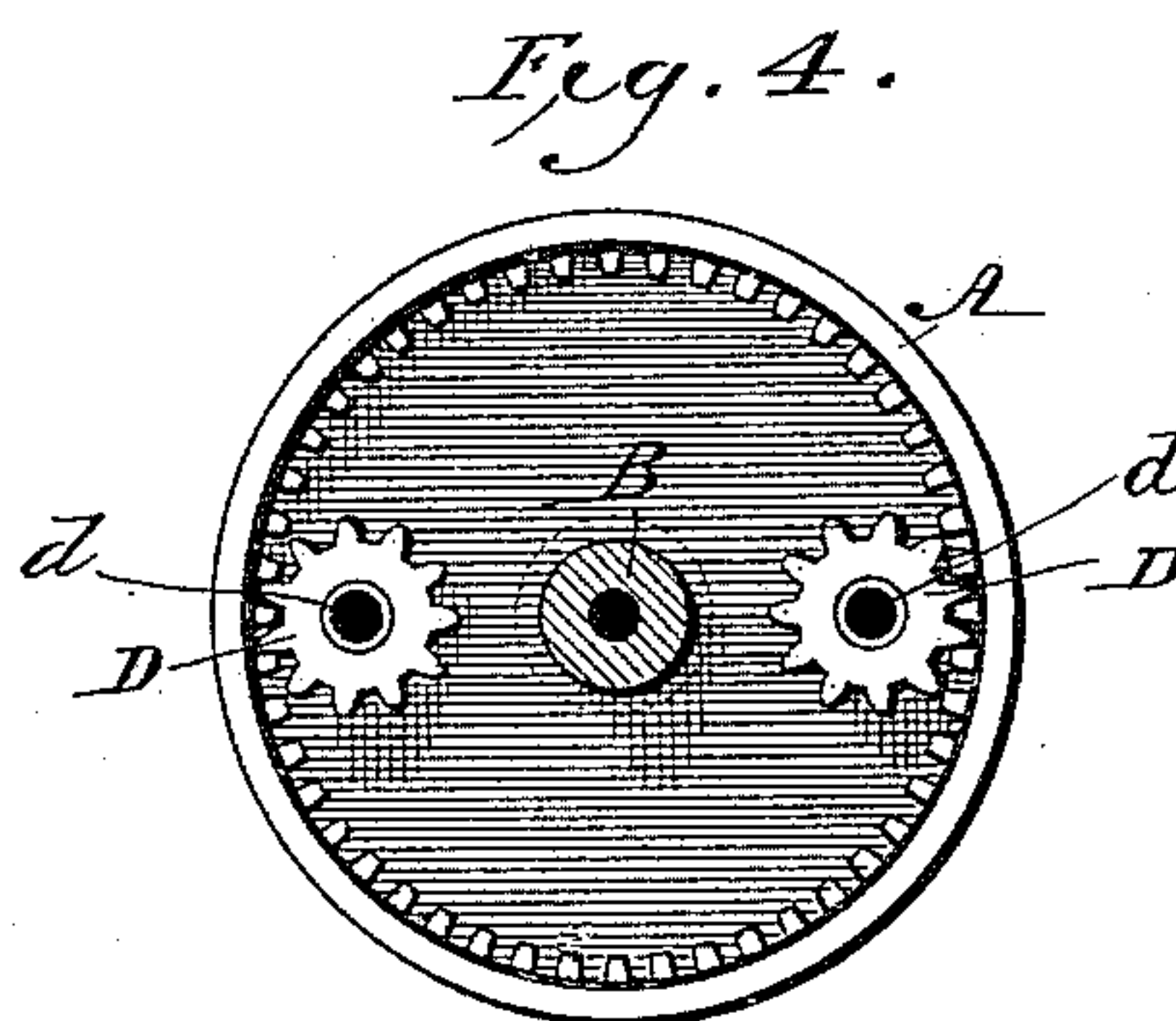
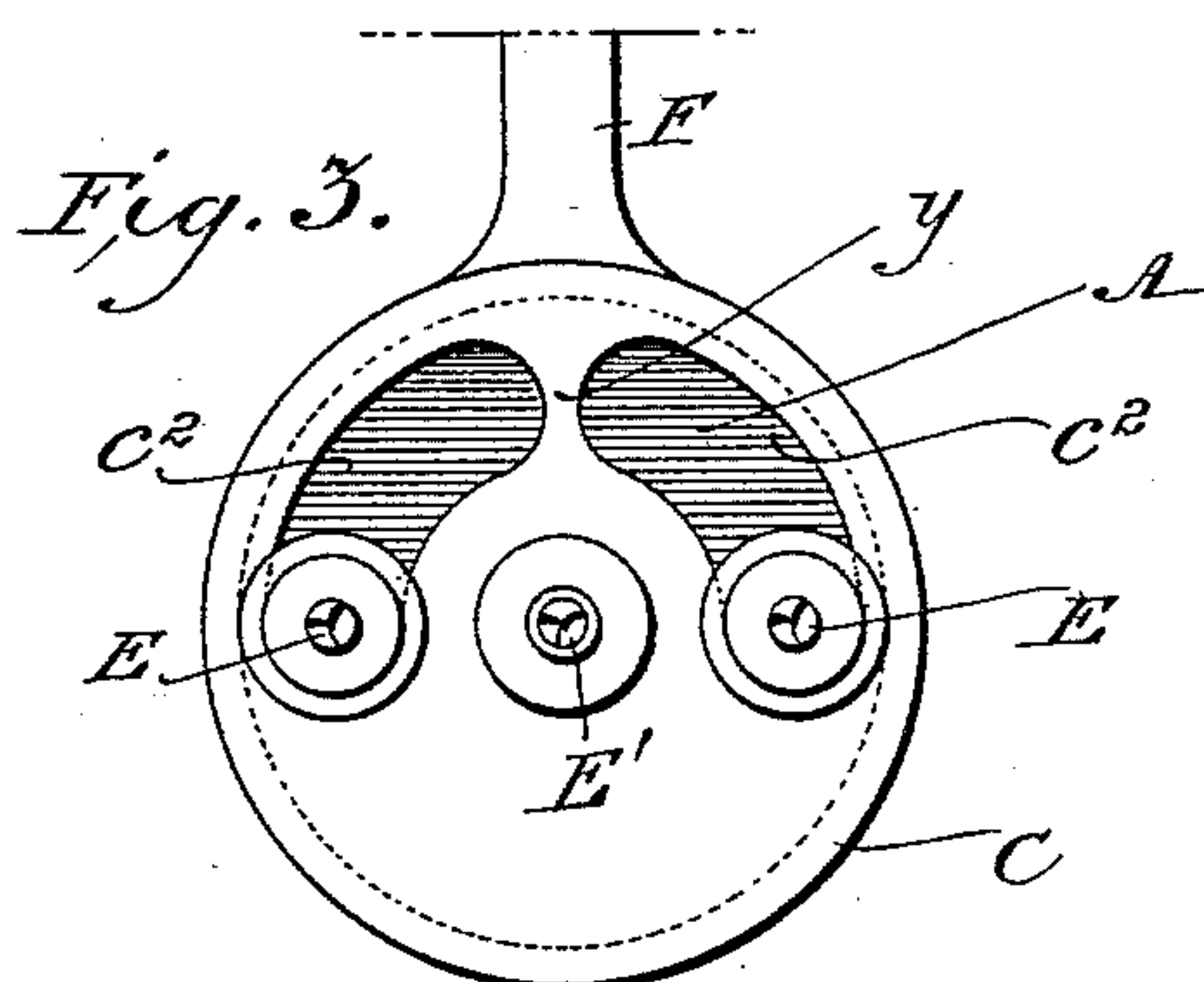
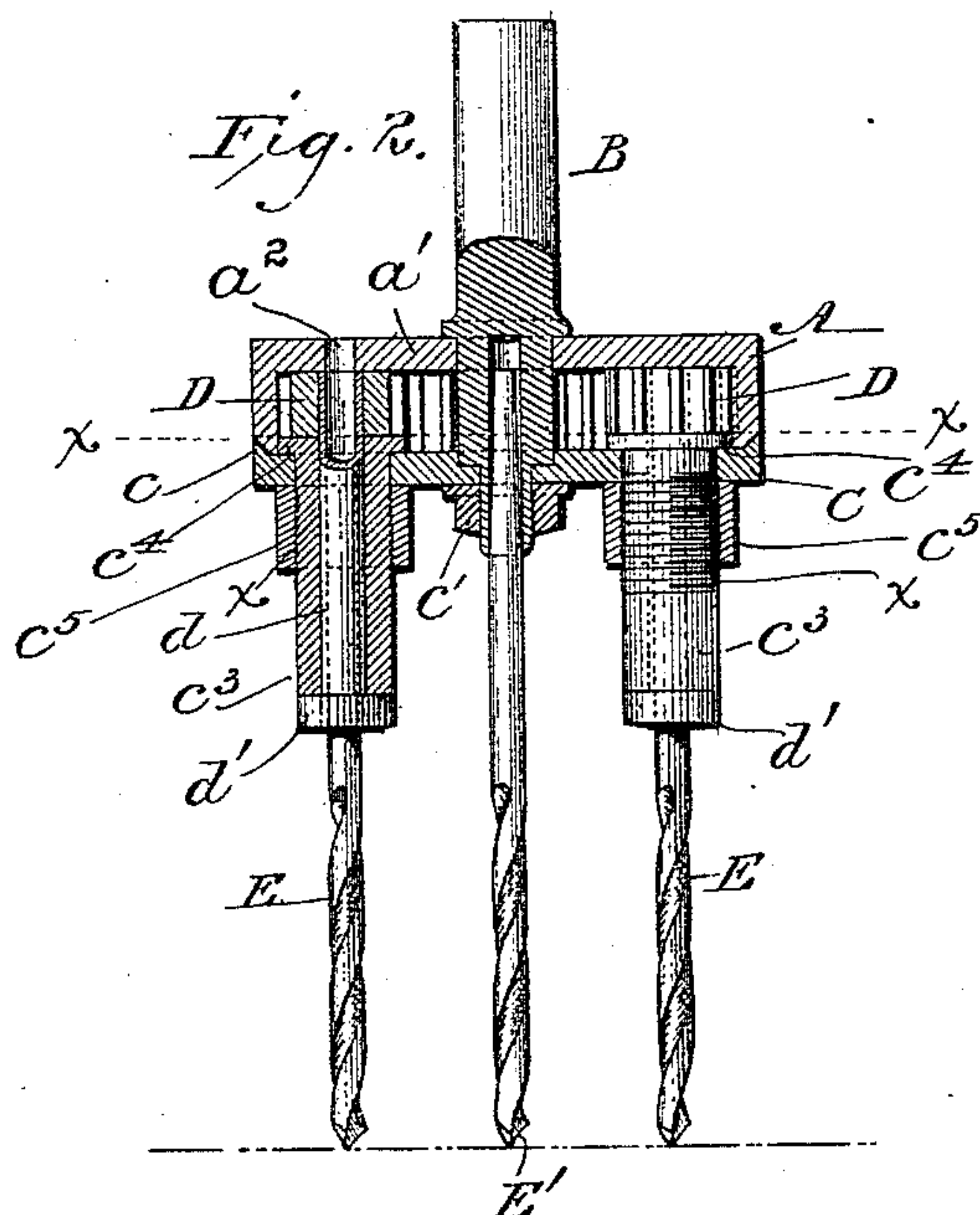
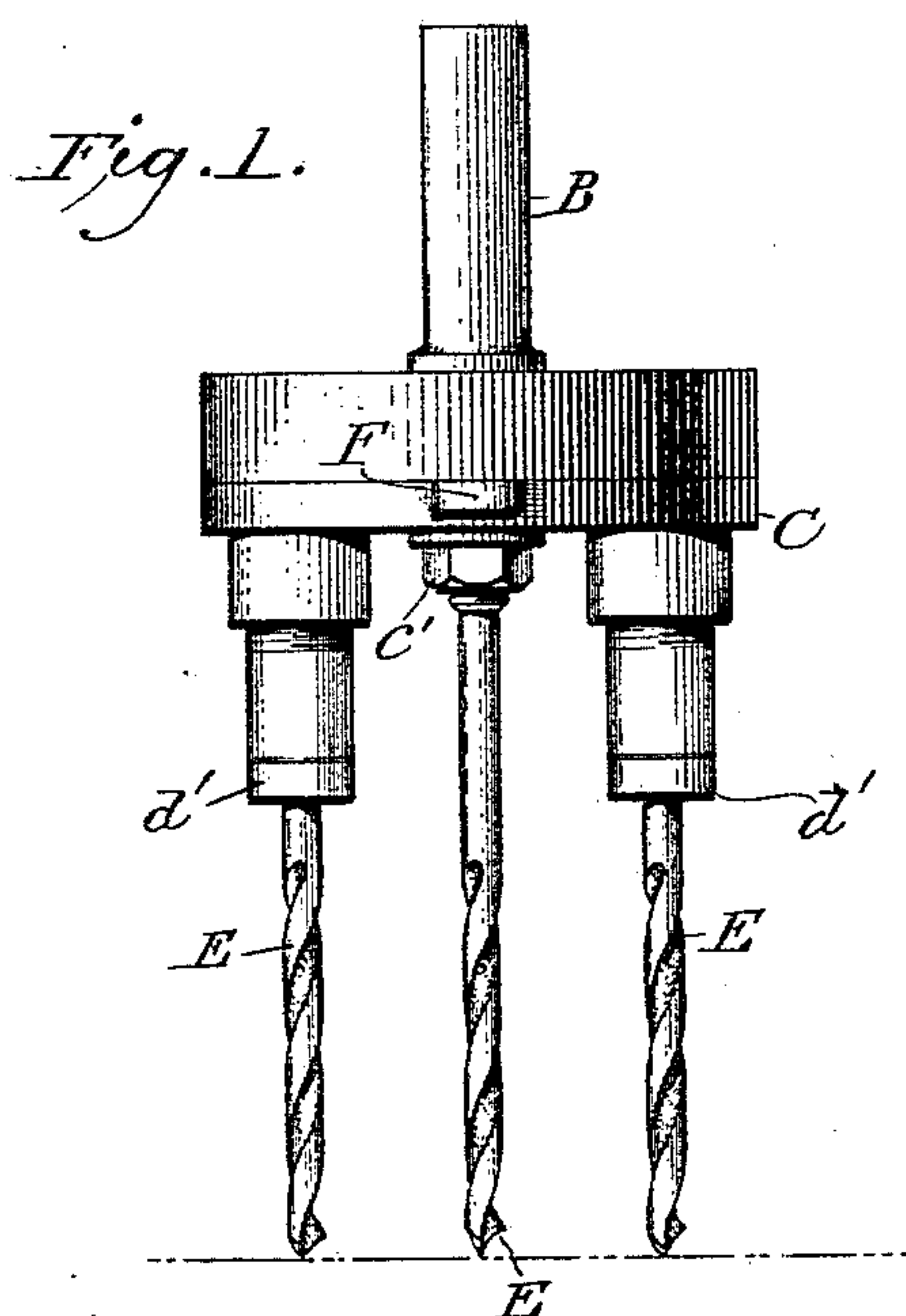


(No Model.)

W. M. NORCROSS.  
BORING TOOL.

No. 457,606.

Patented Aug. 11, 1891.



WITNESSES:  
John T. Nolan,  
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ATTORNEY.



# UNITED STATES PATENT OFFICE.

WILLIAM M. NORCROSS, OF PHILADELPHIA, PENNSYLVANIA.

## BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 457,606, dated August 11, 1891.

Application filed December 31, 1890. Serial No. 376,343. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM M. NORCROSS, a citizen of the United States, residing at the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Boring-Tools, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is a vertical sectional elevation thereof. Fig. 3 is an under side view of Fig. 1. Fig. 4 is a transverse horizontal section, as on the line  $x x$ , Fig. 2. Fig. 5 is a perspective view of the invention as in actual use.

The main object of this invention is to produce a novel boring-tool whereby a series of holes may be drilled simultaneously or successively at predetermined points or intervals in the substance acted upon; and it consists, primarily, in the combination, with a gear-wheel of peculiar construction, the stud or spindle of which is adapted to be suitably rotated, of a drill-bearing pinion or pinions engaged with said gear-wheel and a supporting device for said pinion or pinions arranged concentrically with said gear-wheel and revoluble independently thereof, whereby the said pinion or pinions may be adjusted to any point around the axis of the gear-wheel without being disengaged from the latter, and thus the drill or drills depending from said pinion or pinions may be adjusted and operated accordingly.

The invention also consists in novel provisions whereby the pinions, with their drills, may be adjusted in respect to each other, in order that the distance between the holes bored by said drills may be varied as occasion may require; and it further consists in particular details of construction, which will be hereinafter fully described.

Referring to the annexed drawings, A represents an internal gear-wheel, and B a stud or spindle fixed centrally thereto, which stud or spindle is adapted to be stocked to and driven by the rotatable spindle of a drill-press or similar structure.

C represents a disk or plate disposed against the lower edge of the wheel, so as to be rev-

oluble independently thereof. This disk is preferably provided with a beveled peripheral flange  $c$ , which coincides with the correspondingly-beveled outer edge of the gear A. Thus lateral displacement of the disk is prevented. The lower screw-threaded end of the spindle B extends through the center of the disk, and a set-nut  $c'$ , screwed upon said end, maintains the disk in place.

Contained within the box-like structure formed by the gear A and the disk are two pinions D, which engage the teeth of said gear. In the present instance these pinions are shown arranged directly opposite to each other, and they are fixed upon vertical shafts or studs  $d$ , which extend through and below the disk. These studs are hollow, as seen, in order to receive and hold the tangs of drills or boring-bits E; but of course, if desired, a chuck or other suitable tool-holding device may be fixed upon the studs. By the construction described it will be seen that if the gear A be rotated the pinions D, with their drills, will be correspondingly actuated, so that a couple of holes will be bored simultaneously by the latter. It will also be seen that the disk may be turned around its axis without disengaging the pinions from the teeth of the gear A, and thus the depending drills may be set to bore holes at any prescribed point or points around their circular range of traverse, as occasion may require. I provide the disk with an outwardly-extending arm F, which may abut against an adjacent part of the drill-press, so as to act as a fixed stop to maintain the drills in active position, as shown in Fig. 5, or which arm may serve as a handle by which to turn the disk, with the pinions and their drills, to various points of action, as above mentioned.

I sometimes recess the lower end of the central spindle B for the reception of the tang of a boring-tool  $E'$ , in order that a central hole may be drilled thereby simultaneously with the lateral holes.

To provide for the adjustment of the drills E so as to vary the distance between the same, I have devised the following construction:  $c^2$  represents two slots which are formed concentrically in the disk just below the axes of the pinions D, respectively. Extending



through each of these slots are sleeves  $c^3$ , through which loosely pass the respective studs of the pinions. These sleeves are provided at their upper ends with flanges  $c^4$ , which rest upon the inner face of the disk C, while the lower ends of the studs  $d$  are provided with collars  $d'$ , that bear against the lower ends of the sleeves. The latter are externally screw-threaded at  $x$  for the reception of nuts  $c^5$ , which are adapted to be screwed up hard against the under side of the disk, in order, in conjunction with the opposed flanges, to secure the sleeves in place without affecting the rotation of the pinions with their studs and drills. By the loosening of the nuts  $c^5$  the sleeves will be unclamped, and they, with their connections, may thereupon be adjusted within the range of the slots, respectively, and fixed at the predetermined points of adjustment. It will be obvious that by reason of the concentricity of the slots the pinions during their adjustment remain in engagement with the teeth of the gear A. I have herein described two of these slots  $c^2$ ; but of course the connection  $y$  between the same may be omitted, so as to form one slot. I have also described two pinions in engagement with the gear A; but, obviously, a greater or less number may be employed, as required. If several of these pinions be used, the distance between the adjacent holes may be readily increased by removing the drills from certain pinions.

I sometimes provide the web  $a'$  of the gear A at a proper point near its periphery with a perforation  $a^2$ , below which the stud of either of the pinions D may be moved, in order that the drill may be forced out of the stud by means of a suitable punch driven into the hollow stud by way of the perforation.

Having thus described my invention, I claim as new and wish to secure by Letters Patent—

1. The combination, with the main gear-wheel and means for rotating the same, of the tool-actuating pinion or pinions engaging said gear-wheel, and the supporting-plate for said pinion or pinions revoluble independently of said gear-wheel, substantially as described.

2. The combination, with the main gear-wheel and means for rotating the same, of the tool-actuating pinion or pinions engaging said wheel, and the supporting-plate for said pinion or pinions revoluble independently of said gear-wheel, together with the handle or stop-arm projecting from said plate, substantially as described.

3. The combination, with the main gear-wheel and its spindle, of the plate mounted upon the bottom of the latter so as to be rotatable independently thereof, the pinions engaging the teeth of said gear-wheel, the shafts or studs depending from said pinions, the sleeves adjustably mounted upon said plate and adapted to support the shafts or studs to which the pinions are fixed, and means for securing said sleeves at predetermined points of adjustment, substantially as described.

4. The combination of the internal gear-wheel, its spindle, the pinions engaging said wheel, their spindles, the revoluble slotted plate, the flanged sleeves mounted within the slot or slots in said plate, and the screw-nuts upon said sleeves, substantially as described.

5. The combination, with the internal gear-wheel and means for rotating the same, of the tool-actuating pinion or pinions engaging said gear-wheel, and the supporting device for said pinions, substantially as described.

In testimony whereof I have hereunto affixed my signature this 6th day of December, A. D. 1890.

WILLIAM M. NORCROSS.

Witnesses:

JOHN R. NOLAN,  
JOSHUA PUSEY.