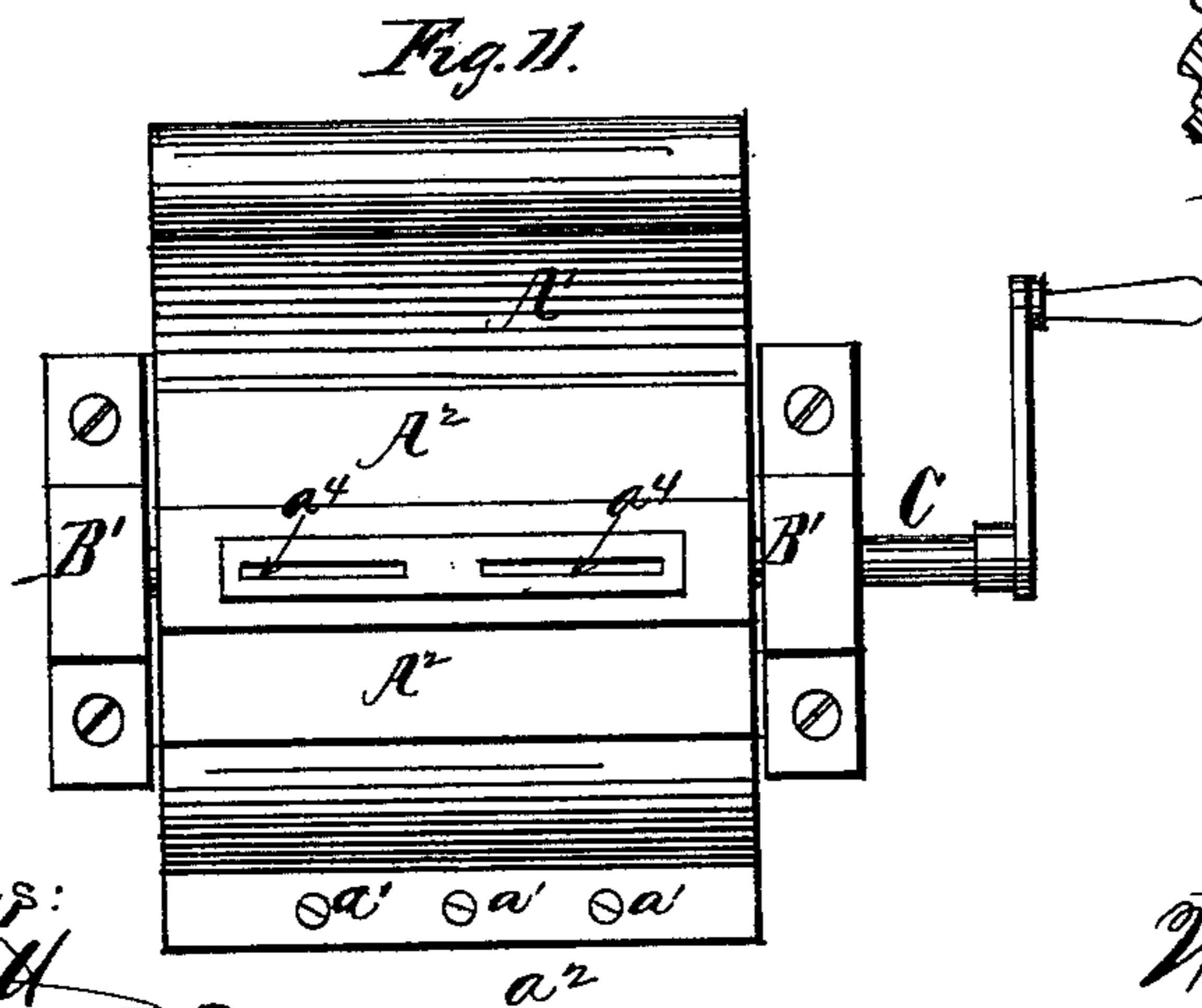
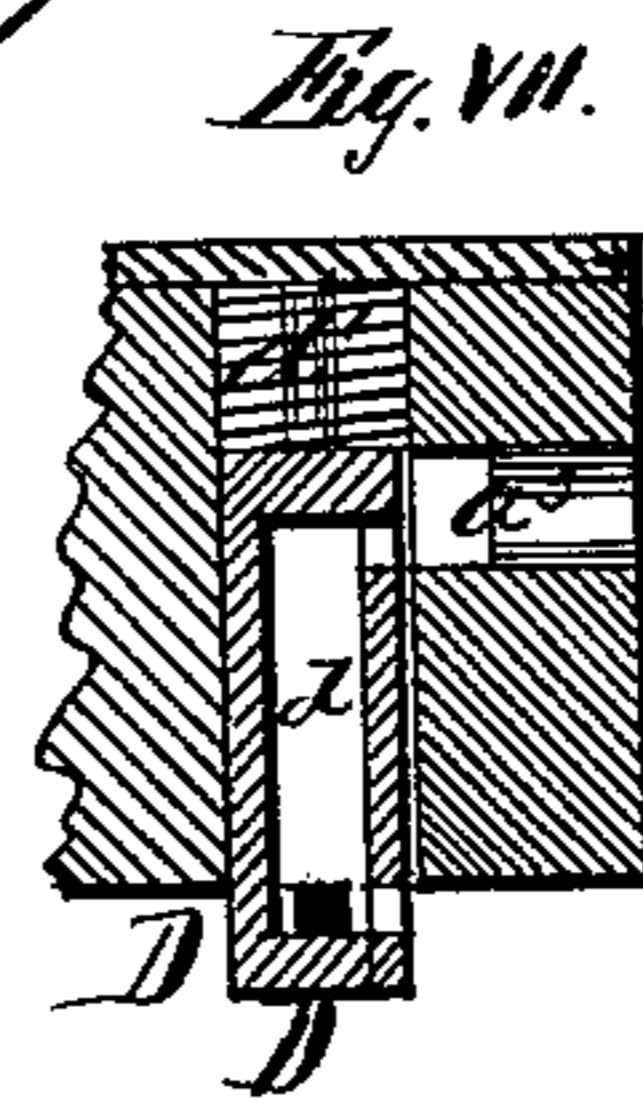
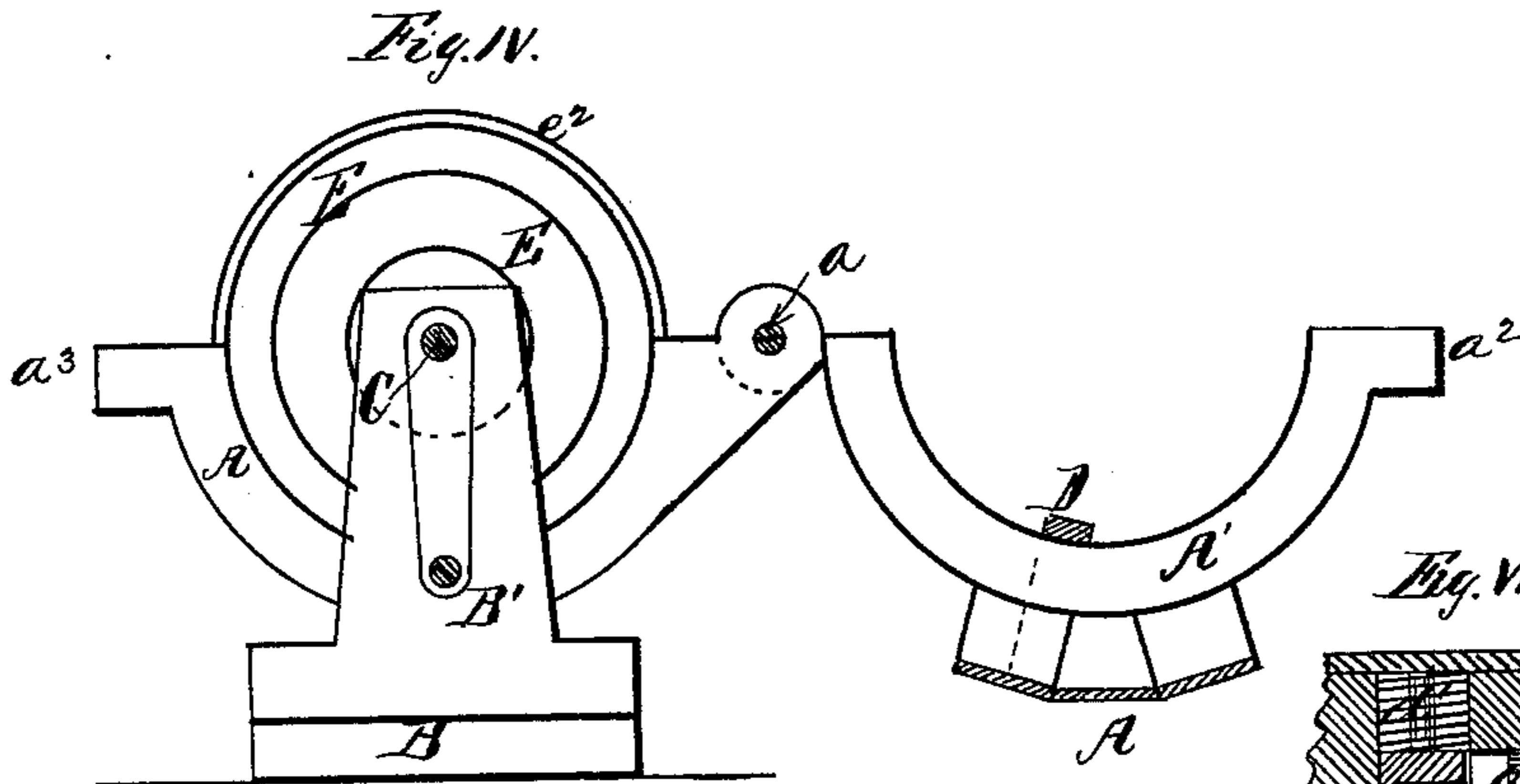
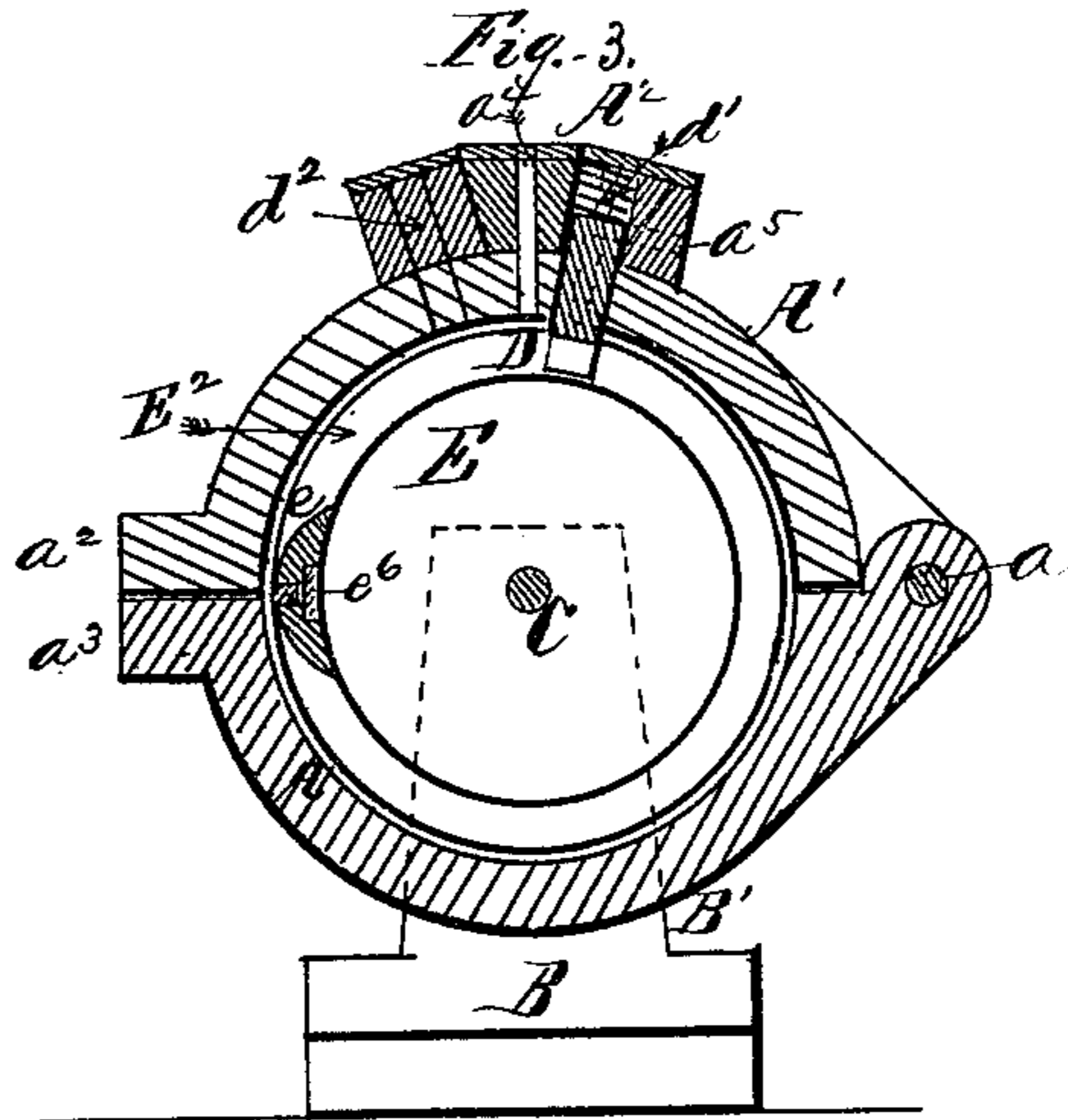
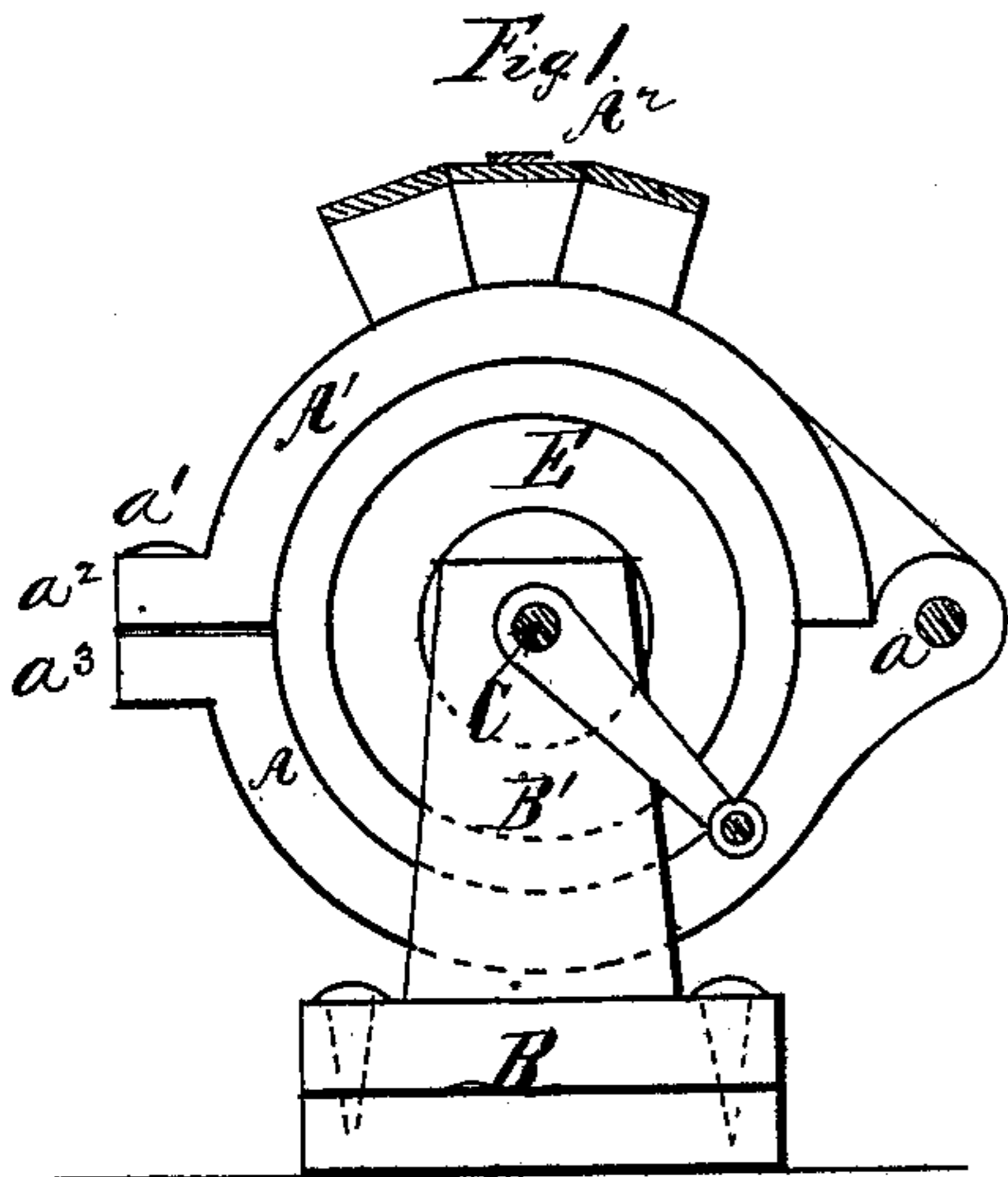


W. R. RIGHTOR.  
Rotary Steam-Engines.

No. 198,214.

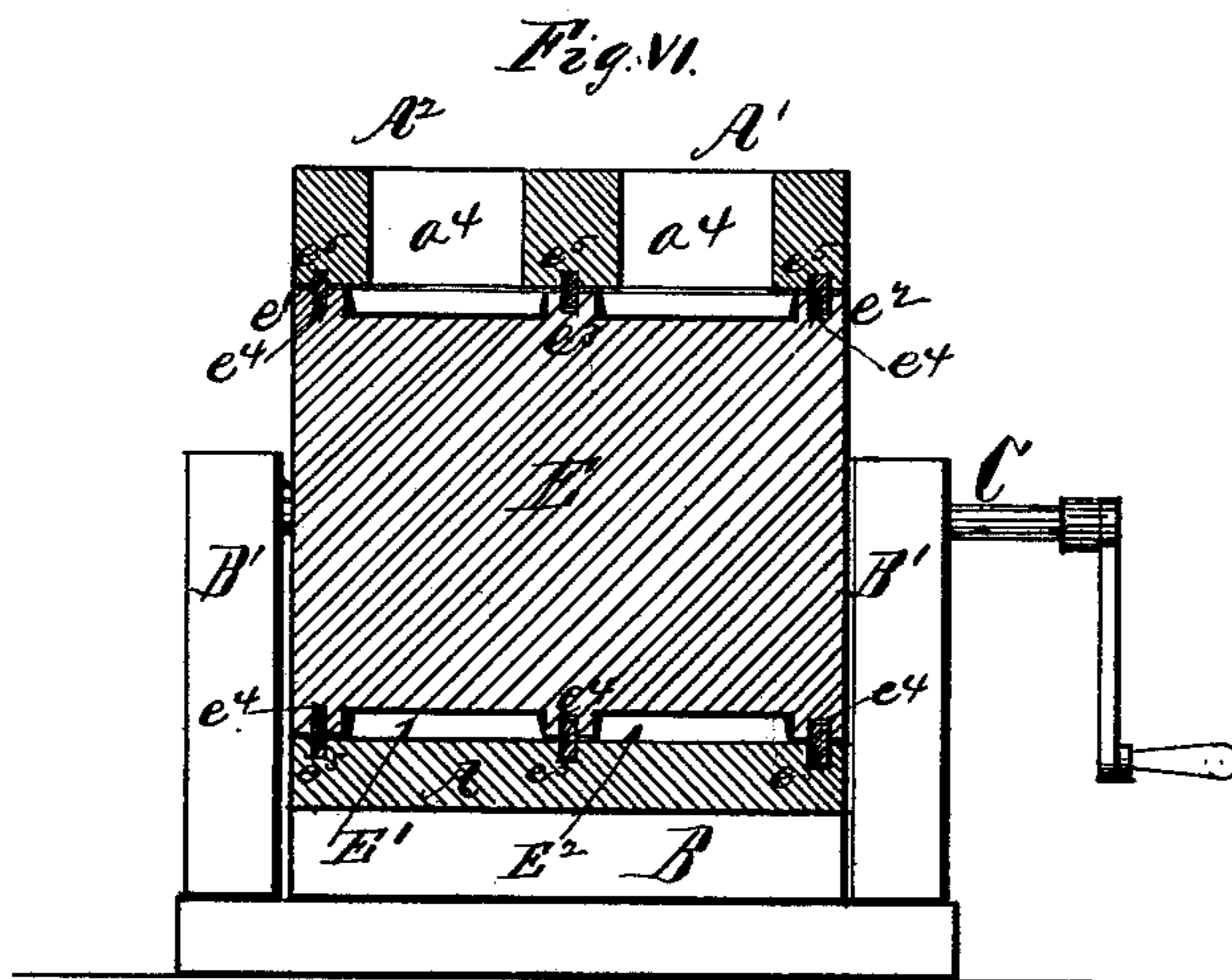
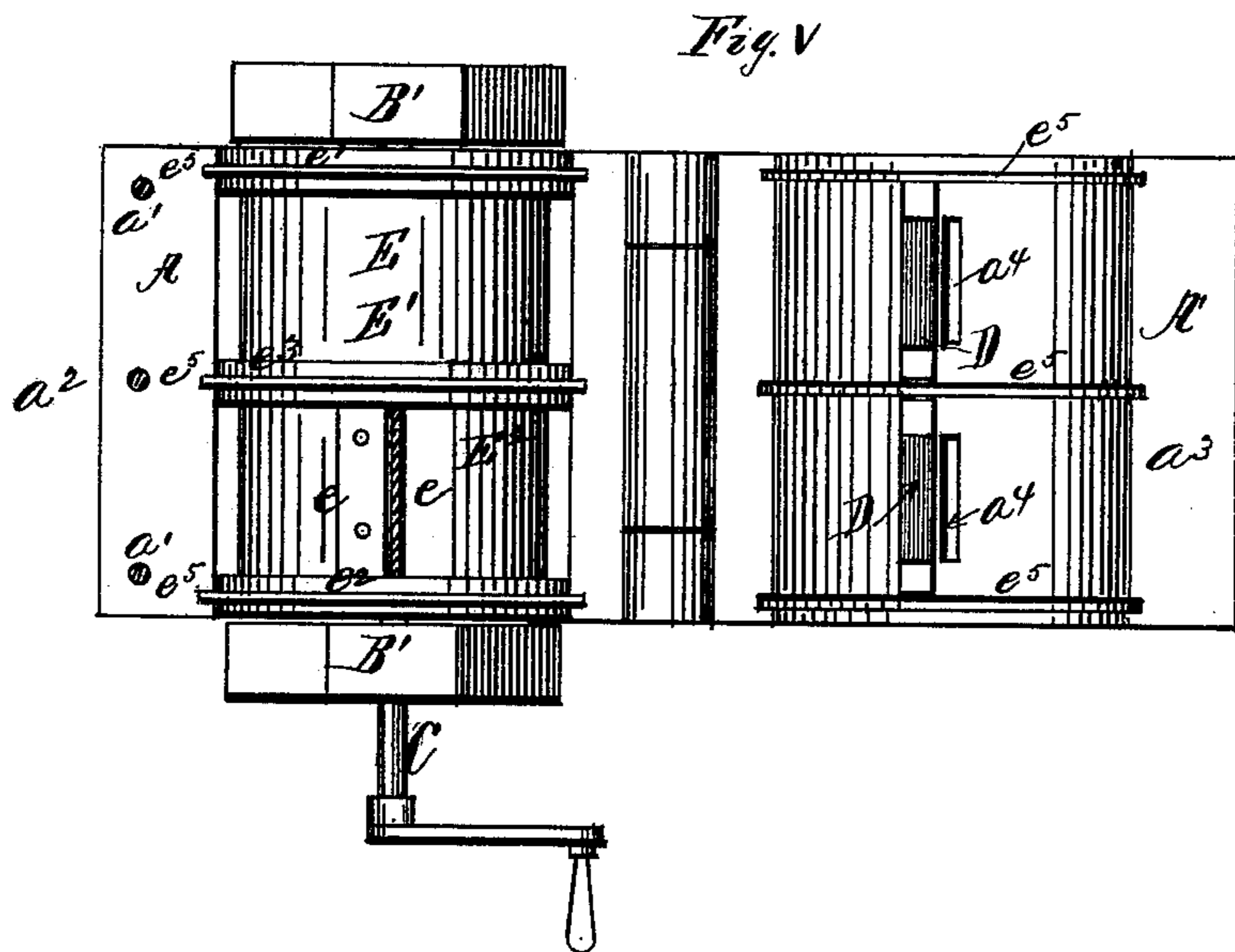
Patented Dec. 18, 1877.



Witnesses:  
J. Darrell  
Richard Lerner

Inventor:  
William R. Rightor.  
Per: Henry Lerner  
Atty.

W. R. RIGHTOR.  
Rotary Steam-Engines.  
No. 198,214. Patented Dec. 18, 1877



Witnesses:  
F. Darratt  
Richard Lerner

Inventor:  
William R. Rightor  
Per: Henry Lerner  
Atty.

# UNITED STATES PATENT OFFICE.

WILLIAM R. RIGHTOR, OF HELENA, ARKANSAS.

## IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. **198,214**, dated December 18, 1877; application filed August 2, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM R. RIGHTOR, of Helena, in the county of Phillips and State of Arkansas, have invented a new and useful Improvement in Rotary Steam-Engines, of which the following is the specification:

The nature and object of the invention will be readily understood by the subjoined description and by reference to the accompanying drawings, of which—

Figure 1 is an end elevation of the improved engine. Fig. 2 is a general plan of the same. Fig. 3 is a transverse sectional elevation, taken through one of the steam-ports. Fig. 4 is an end elevation of the machine, showing the top half of the cylinder thrown open on its hinge, so as to gain access to the working parts. Fig. 5 is a plan of the parts as shown in the position indicated in Fig. 4. Fig. 6 is a longitudinal sectional elevation of the machine. Fig. 7 is a sectional view of one of the valves and its seats.

The cylinder or outer casing of the machine is divided into two parts, A and A<sup>1</sup>, the lower part, A, of which is to be firmly fixed to the bed-plate B, from which also rise the pillar-blocks B', in which the bearings of the driving-shaft C are placed. The top section, A<sup>1</sup>, of the cylinder is hinged to the lower section by the pivot-rod a, as shown in the drawings, so that it may be thrown open, as is illustrated in Figs. 4 and 5.

When the two parts of the cylinder are closed together, as in use, they will be held firmly together by means of the screw-bolts a<sup>1</sup>, that pass through the lugs a<sup>2</sup> a<sup>3</sup>, attached, respectively, to the sections A and A<sup>1</sup>. On top of the cylinder, constructed as above described, and attached to and forming part of the section A<sup>1</sup>, will be the steam-chest A<sup>2</sup>, which has seats for two abutment-valves, D D, and apertures a<sup>4</sup> for exhaust-pipes, and apertures a<sup>5</sup> for the introduction of the steam-pipes.

The abutment-valves D D are constructed as shown best in Figs. 3 and 7. Each of them has an open port, d, through which steam passes from the steam-entrance a<sup>5</sup> to the steam-chamber of the engine, and each of them is backed by suitable springs d<sup>1</sup>, which will habitually press them down to the periphery of the working-piston E, which revolves within the

cylinder A A<sup>1</sup>, and rests upon the driving-shaft C.

The piston E is cylindrical in form, is driven rotarily by the pressure of steam against its piston-wings e, and is divided into two annular chambers, E<sup>1</sup> and E<sup>2</sup>, formed by the flanges e<sup>1</sup> and e<sup>2</sup> and a central flange, e<sup>3</sup>, each of these said flanges being constructed with sides sloping outwardly from the bottom of its respective chamber E<sup>1</sup> or E<sup>2</sup>, as shown clearly in Fig. 6; and in the central part of each of the flanges e<sup>1</sup> e<sup>2</sup> e<sup>3</sup> is formed a groove, into which is placed an annular spring-packing, e<sup>4</sup>, that closes the sides of the steam-chambers E<sup>1</sup> and E<sup>2</sup> steam-tight against the surrounding cylinder A A<sup>1</sup>, concentric grooves e<sup>5</sup> being formed in the said cylinder, into which the said packing-rings enter and form a perfectly steam-tight packing.

The chambers E<sup>1</sup> and E<sup>2</sup> are each divided in two by the piston-wings e. These wings are set diametrically opposite each other in the said chambers, so that they will pass in succession the induction and exhaust ports, thereby causing a continuous action in one of the steam-chambers of the piston, and a consequent obviation of any dead-point.

The piston-wings e are formed of two wedge-shaped ledges, as shown clearly in Fig. 3, and between these ledges (which pass entirely across the spaces of their respective chambers E<sup>1</sup> E<sup>2</sup>) is placed a spring-packing, e<sup>6</sup>, which presses habitually against the surrounding cylinder as the piston is rotated, thereby securing a steam-tight joint, automatically adjustable, between these parts.

By using the wings e with sloping sides on both sides, the engine may be run in either direction with equal facility, the sliding abutment-valves D D being compelled to rise automatically over these piston-wings as they pass under them, and then the springs d<sup>1</sup> will press the said abutments down again to the periphery of the piston.

The machine may be constructed so as to be run in either direction by making two sets of seats for the operating-valves D D on opposite sides of the exhaust-openings a<sup>4</sup>, and then by placing the said valves in the desired seats, and closing the seats not used with plugs d<sup>2</sup>, which must, of course, be tightly fitted in.

Having described my invention, I claim—

1. The piston E, formed into two chambers, E<sup>1</sup> and E<sup>2</sup>, and provided with pressure-heads e and spring-packing e<sup>4</sup> and e<sup>6</sup>, in combination with sliding valves D, having ports d, spring d<sup>1</sup>, and exhaust a<sup>4</sup>, and steam-apertures a<sup>5</sup>, and the hinged and bolted cylinder A A<sup>1</sup>, substantially as described.

2. The outer cylinder of a rotary steam-en-

gine, divided into the sections A A<sup>1</sup>, hinged together at a, and bolted together at a<sup>1</sup> a<sup>2</sup> a<sup>3</sup>, substantially as and for the purpose set forth.

This specification signed this 5th day of July, 1877.

W. R. RIGHTOR.

Witnesses:

RICHARD GERNER,  
CHR. REIGELMAN.