(No Model.)

3 Sheets—Sheet 1.

L. S. CHICHESTER.

AIR COMPRESSOR.

No. 333,994. Patented Jan. 12, 1886.

Fig: 1.

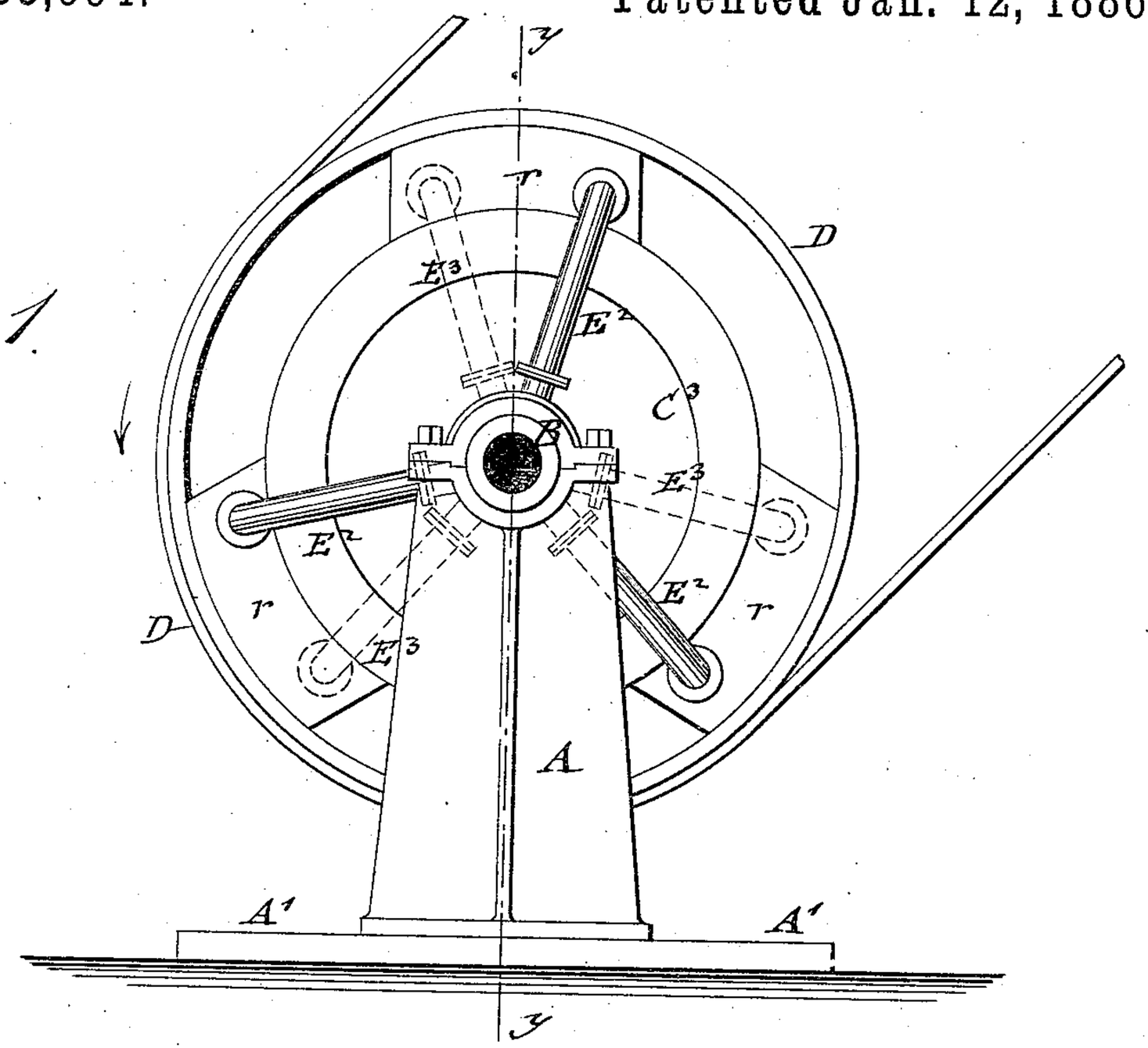


Fig: 2.

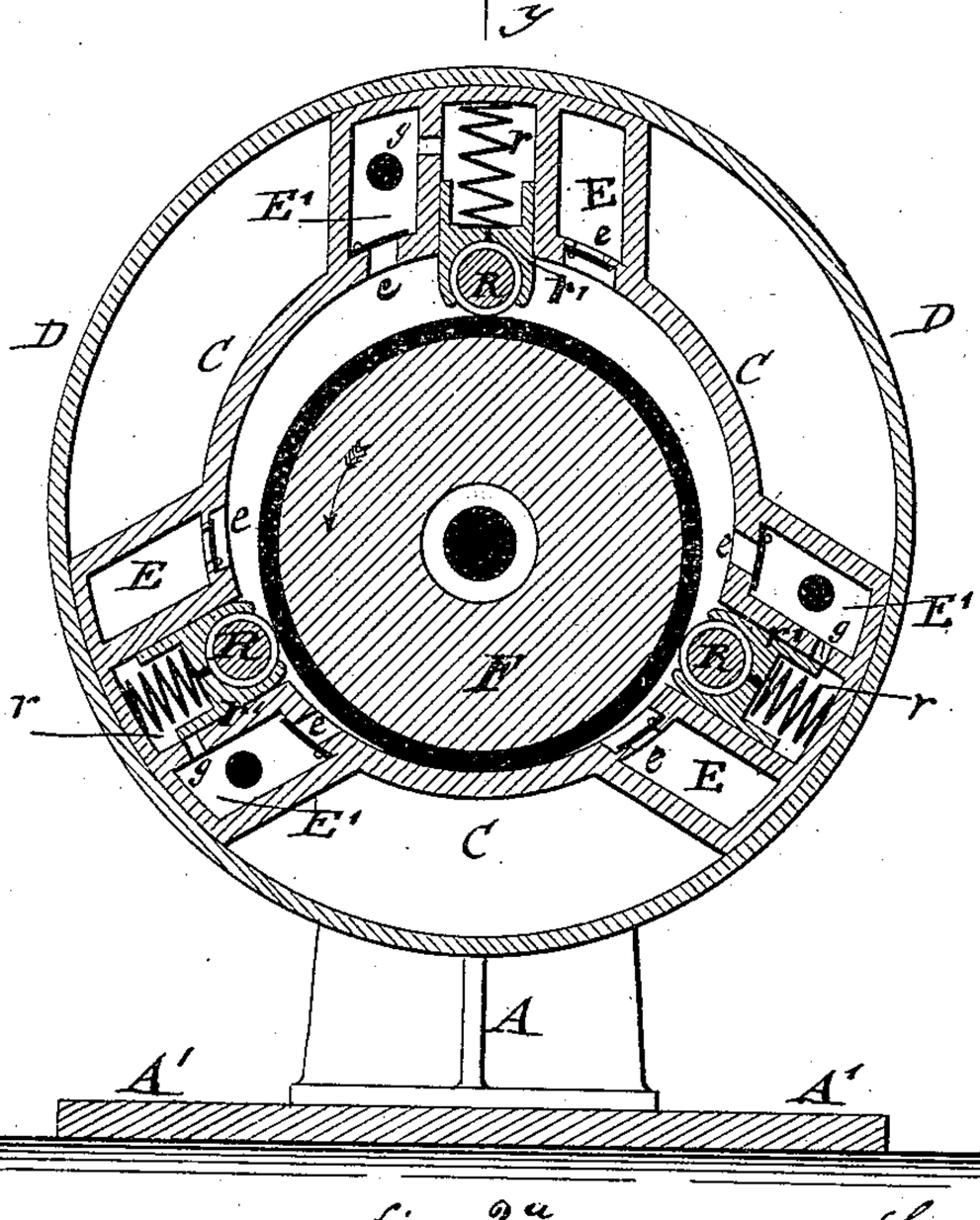
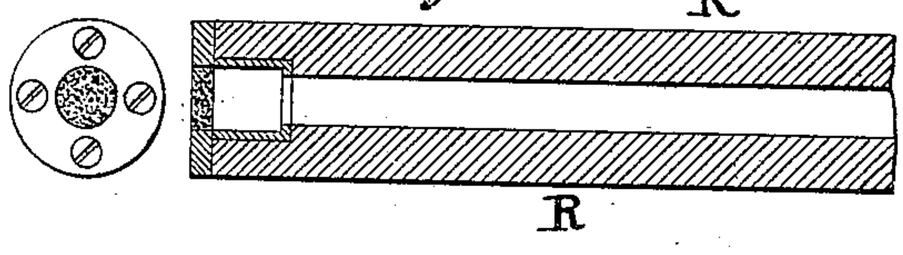


Fig: 2a.



WITNESSES:

A. Schehl.

Kreymann

INVENTOR

Lewis S. Chichester

BY

Goepel & Raegener

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 2.

L. S. CHICHESTER.

AIR COMPRESSOR.

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Fig. 3.

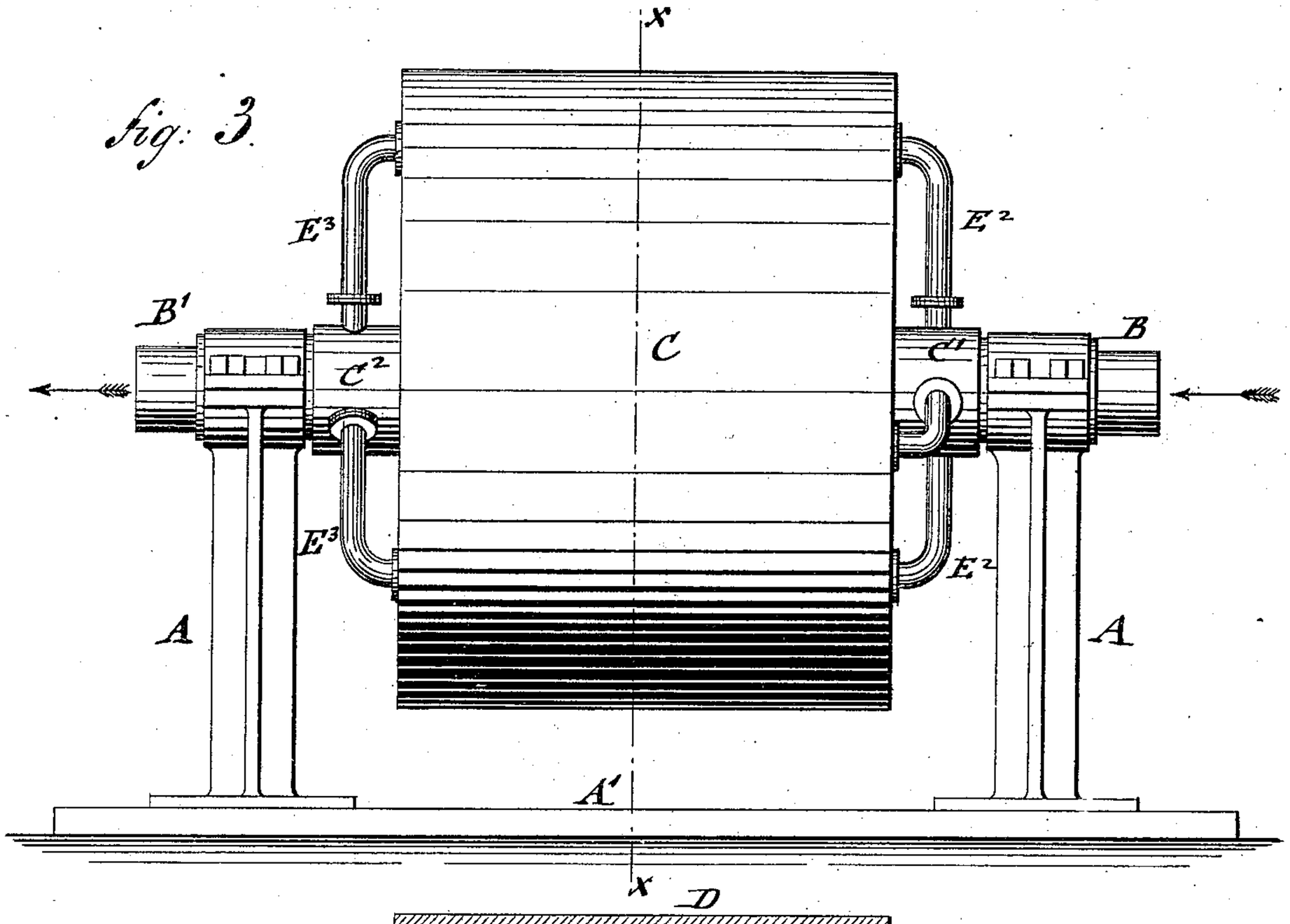


Fig. 4.

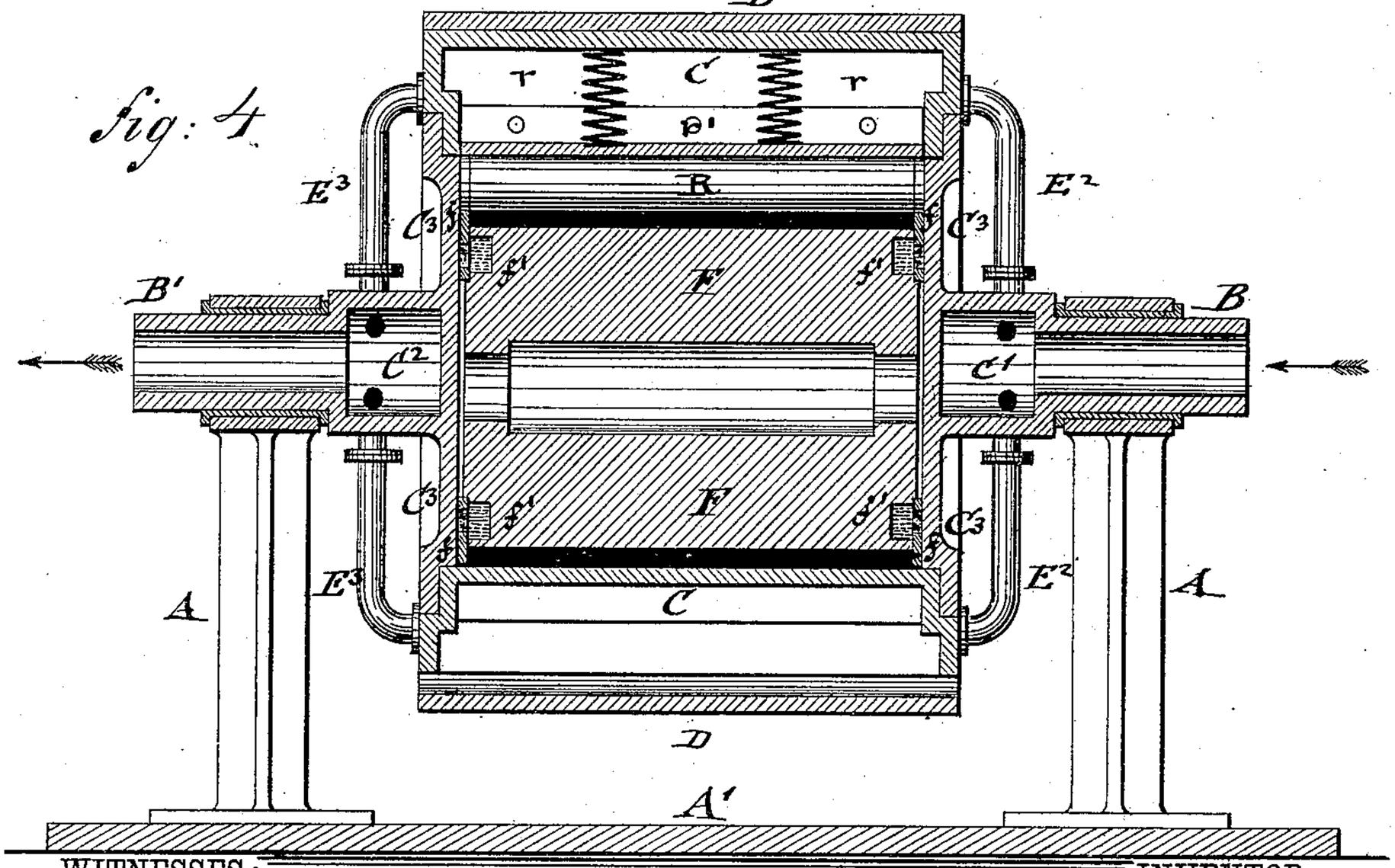
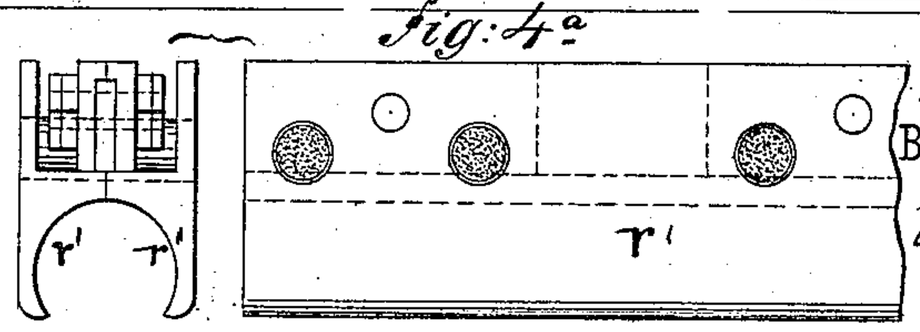


Fig. 4a.



WITNESSES:

A. Schehl.

Sidney Mann

INVENTOR

Lewis S. Chichester

BY

Goepel & Raegener

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 3.

L. S. CHICHESTER.

AIR COMPRESSOR.

No. 333,994. Patented Jan. 12, 1886.

Fig. 5.

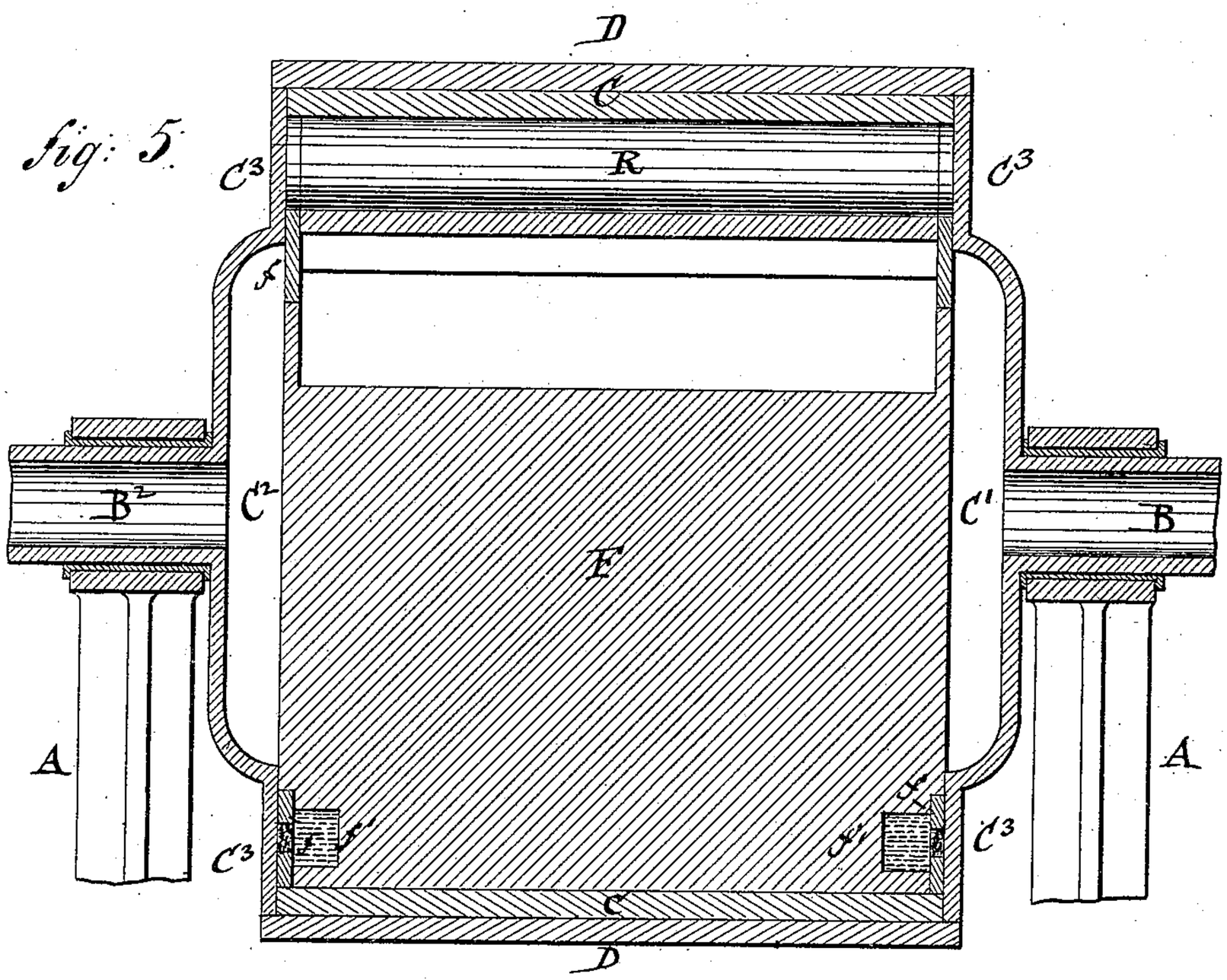
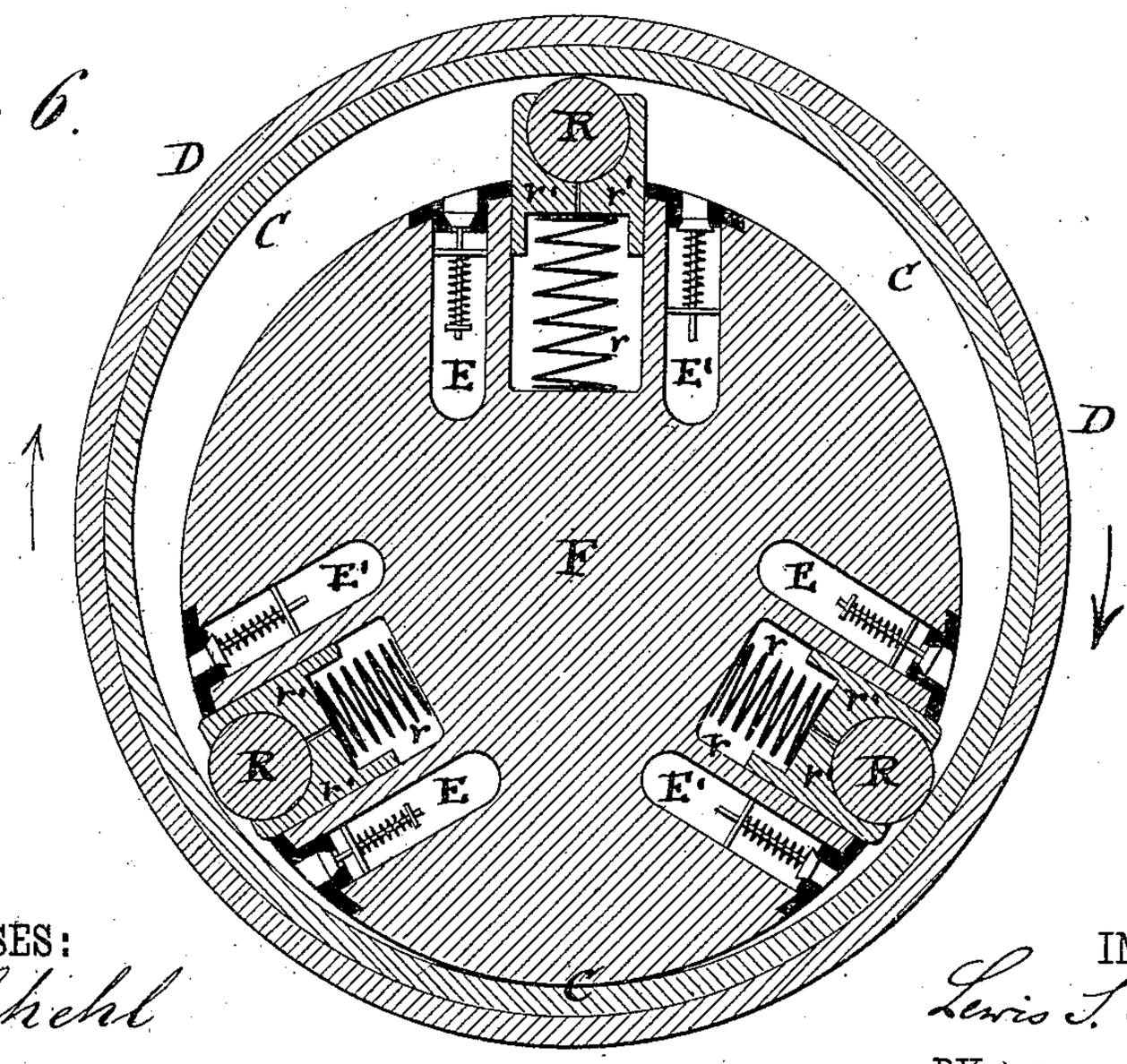


Fig. 6.



WITNESSES:

A. Schiehl

Sidney Brann

INVENTOR

Lewis S. Chichester

BY Goepel & Raegener

ATTORNEYS.

UNITED STATES PATENT OFFICE.

LEWIS S. CHICHESTER, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO C. M. EDWARD SCHROEDER, OF SAME PLACE.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 333,994, dated January 12, 1886.

Application filed November 19, 1884. Serial No. 148,282. (No model.)

To all whom it may concern:

Be it known that I, LEWIS S. CHICHESTER, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

This invention has reference to improvements in that class of rotary air-compressors for which an application for Letters Patent has been filed by me heretofore, under date of December 15, 1883, and Serial No. 114,599, the improvements being designed with a view to simplify the construction of the same and render it more effective in action.

In the accompanying drawings, Figure 1 represents an end elevation of my improved air-compressor. Fig. 2 is a vertical transverse section of the same on line *x x*, Fig. 3. Fig. 2ª is a detail side view and end view of one of the contact-rollers. Fig. 3 is a side elevation; Fig. 4, a vertical longitudinal section of the same on line *y y*, Fig. 1. Fig. 4ª is a detail side view and vertical longitudinal section of one of the roller-supporting bearings; and Figs. 5 and 6 are respectively a vertical longitudinal section and a vertical transverse section of a modified form of my improved air-compressor.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A represent the supporting-standards of my improved air-compressor, which are securely attached to a bed-plate, A′. The standards A A carry in bearings at their upper ends the hollow shafts or trunnions B B′ of the heads C^3 of an exterior cylindrical casing, C. The trunnions communicate with enlarged chambers C′ C^2, which are attached to the heads C^3 C^3 of the casing C. The casing C is provided, preferably at three or more points, with radial compartments *r r*, which extend through the full length of the cylinder, and which serve to guide the supporting bearings or shells *r′* of the spring-cushioned contact-rollers R. The compartments *r* for the contact-rollers R are encircled by a second cylinder, D, concentric to the casing C, which outer cylinder serves as a pulley for the belt by which the air-compressor is rotated. At both sides of the roller-guiding compartments *r* are arranged air-chambers E E′, which extend throughout the full length of the cylinder C. The chambers E at one side of the roller-guiding compartments *r* communicate by radial pipes E^2 with the chamber C′ and the induction-trunnion B, while the chambers E′ at the other side of the roller-compartments communicate at their opposite ends by radial pipes E^3 with the chamber C^2 and the eduction-trunnion B′ of the opposite cylinder head. The air-chambers E E′ are provided with valved openings *e e*, that communicate with the interior of the casing C. The contact-rollers R are made of lignum-vitæ, steel, or other suitable durable material, and held in contact with an interior rubber-covered roller or piston, F, of steel or other metal, which is provided with anti-friction rings *f* at the ends, said rings having openings corresponding with oil-receiving pockets *f′* in the ends of the heavy roller F. The openings of the pockets *f′* are closed by felt plugs, so that small quantities of lubricating material are fed through said plugs, so as to lubricate the contact-faces of the rings *f′* of the roller F, with the heads C^3 of the casing C, and reduce thereby the friction between the heads and roller as much as possible.

Owing to its gravity, the interior roller or piston, F, forms contact at its lower part with that part of the casing C at that time vertically below the same, so that no air can pass at that point. As the rollers R are always held by their cushioning-springs in contact with the interior piston, F, and as the casing C revolves around the same by the motion imparted by the belt and exterior pulley, D, the air is drawn in through the trunnion B and the valved chambers E to the interior of the casing C, compressed by the rotation of the same as the spaces between the interior roller, F, and casing C are gradually diminished, and then forced in compressed state through the valved openings of the chambers E′, eduction-pipes E^3, chamber C^2, and trunnion B′, to a reservoir or place of use.

For each revolution of the casing C three

separate bodies of air are drawn in and compressed, so that a nearly-continuous compression of the air takes place, while the effect of the individual compressions is hardly noticeable.

The eduction-chambers E^2 communicate by air-ports *g*, Fig. 2, with the roller-guiding compartments *r*, so as to admit compressed air to the back of the roller bearings or shells *r'* and form thereby an air-cushion. The supply of air is cut off as soon as the roller-bearings *r'* are moved back far enough into the compartments *r r* that the side walls of the bearing close the air-ports *g*. These air-cushions assist the cushioning-springs of the roller bearings or shells *r*, secure the intimate contact of the rollers with the interior roller or piston, and assist in the smooth and effective running of the machine.

The ends of the contact-rollers and the side walls of the roller-bearings are lubricated in the same manner as the end rings of the interior piston, F, by means of oil-pockets and felt plugs, as shown, respectively, in Figs. 2^a and 4^a.

In place of arranging the roller-guiding compartments and the air induction and eduction chambers radially to and as a part of the casing C, they can be arranged so as to economize space within the interior roller or piston, F, as shown in Figs. 5 and 6. In this case the air-chambers $C' C^2$ are arranged as a part of the heads C^3 of the exterior casing. C, upon which is located directly the pulleys D, for the driving-belt. The casing C is, in this case, covered at its inner surface with a layer of rubber or other suitable elastic material.

The air-chambers $C' C^2$ communicate with the hollow trunnions B B' and with the air-chambers E E', arranged at both sides of the roller-guiding compartments *r r*. The air-chambers E communicate with the air-chamber C' and trunnions B, while the air-chambers E' communicate with the air-chambers C^2 and trunnion B'.

The exterior portion of the heads C^3 forms contact with the end rings, *f*, of the roller F, the contact-faces being lubricated in the same manner as in the device shown in Fig. 4, so that the friction between them and the heads of the casing is reduced as much as possible.

The air-chambers E are provided with openings having valves opening into the casing C, so as to supply air to the spaces between the casing C, interior roller, F, and the contact-rollers R R. By the rotation of the casing C the air is compressed in said interior spaces and forced through openings into the air-chambers E', the valves of which open to the inside of said chambers. From the air-chambers E' the compressed air is conducted to the trunnion B and the place of use.

My improved air-compressor has the advantage that an almost continuous body of compressed air can be supplied for use wherever required, the quantity of air compressed being increased with the increase of speed of the compressor and the pressure regulated in connection with a suitable receiver connected to the eduction-trunnion.

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

1. The combination of a rotating casing, C, having an exterior pulley, D, an interior roller or piston, F, contact-rollers R, spring-cushioned guide-bearings *r' r'* for said rollers, roller-compartments *r r*, air induction and eduction chambers E E', having valved openings communicating with the interior of the casing C, and air-ports *g g*, connecting the eduction-chambers E' with the roller-compartments *r r* in rear of the rollers, whereby air-cushions are formed behind said rollers, substantially as and for the purpose set forth.

2. A roller provided with lubricating end pockets and with an anti-friction ring provided with holes opposite said pockets, said holes being adapted to receive felt plugs, through which the lubricant passes, substantially as described.

3. In an air-compressor, the combination of the rotary casing, the interior rolling piston, spring-cushioned rollers bearing against the periphery of said piston, radial compartments, and roller-bearings for said rollers, adapted to slide in said compartments, said roller-bearings being provided with lubricating devices in their side walls, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

LEWIS S. CHICHESTER.

Witnesses:

PAUL GOEPEL,

SIDNEY MANN.