

(No Model.)

2 Sheets—Sheet 1.

J. H. MOORE.
AIR COMPRESSING PUMP.

No. 534,340.

Patented Feb. 19, 1895.

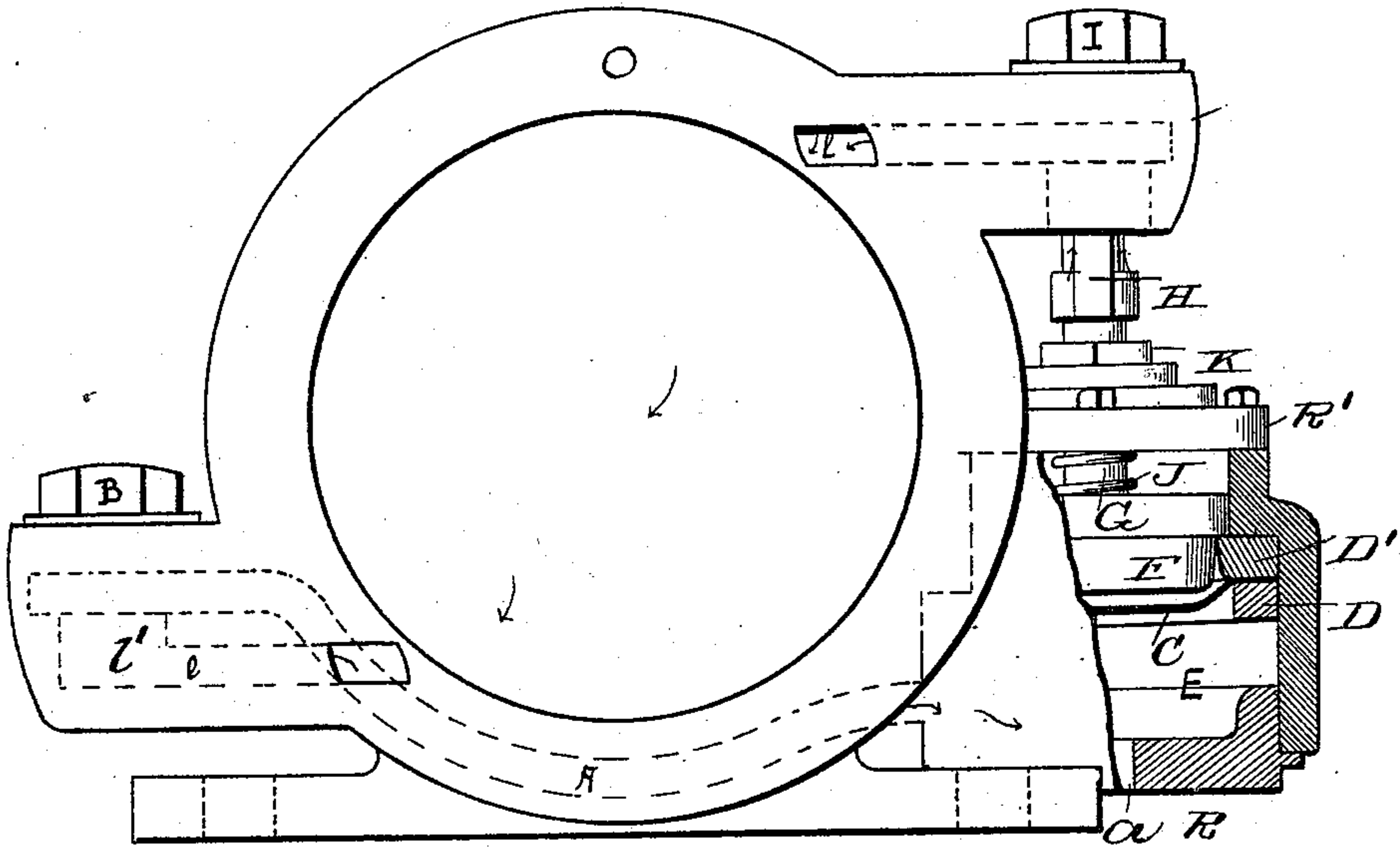


Fig 1

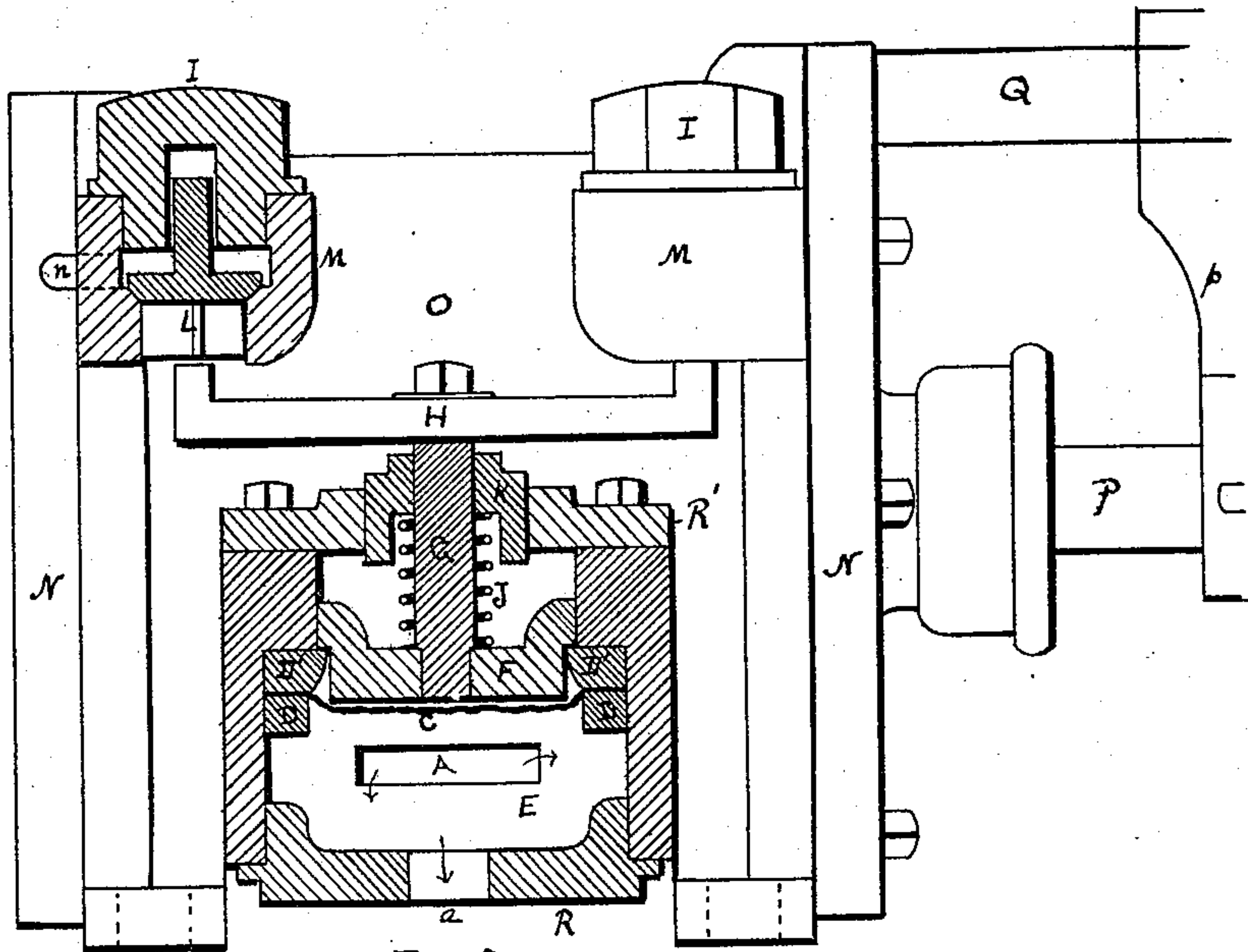


Fig 2

Witnesses

Moses L. Rothschild
Gertrude H. Anderson

INVENTOR

James H. Moore

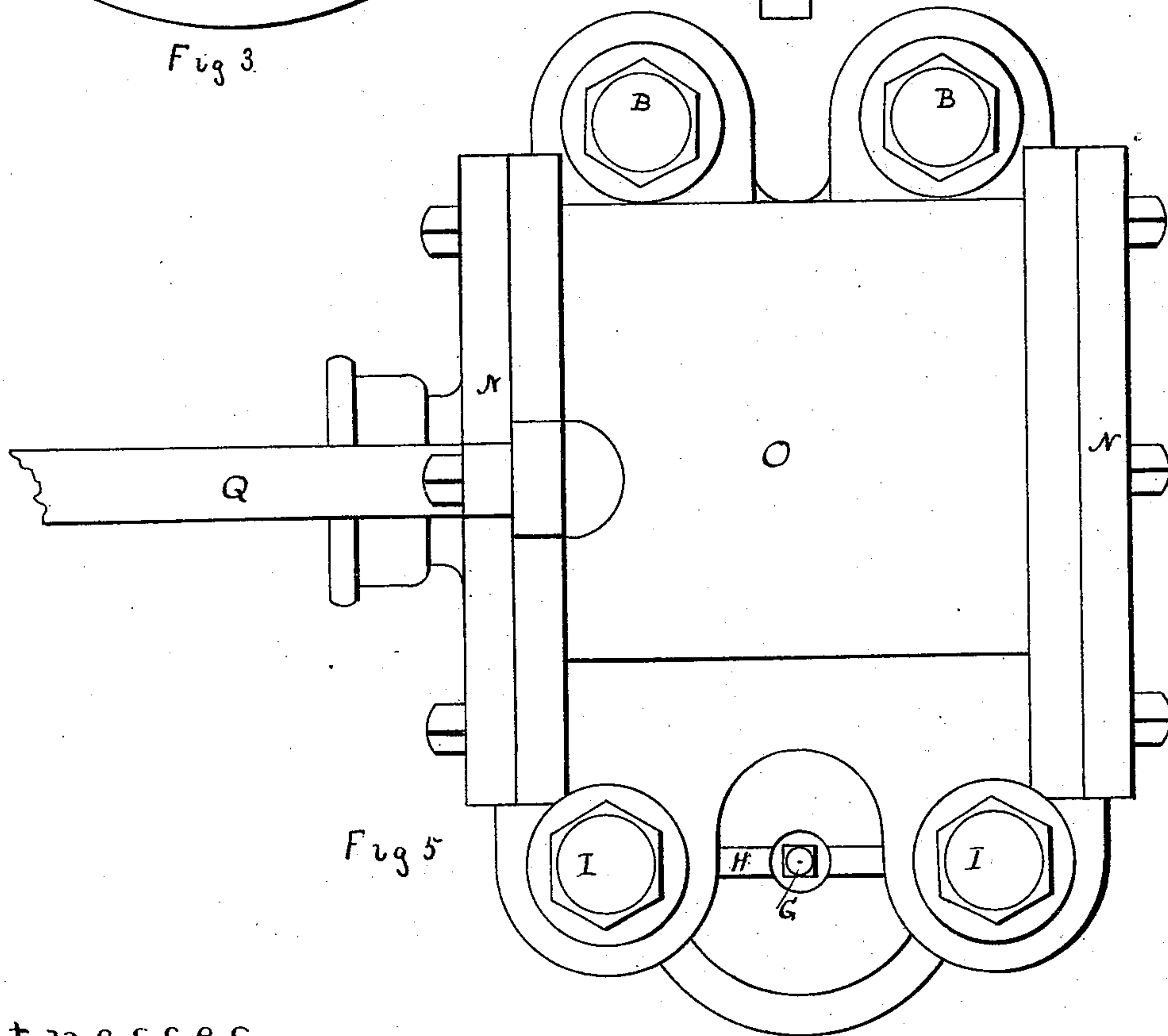
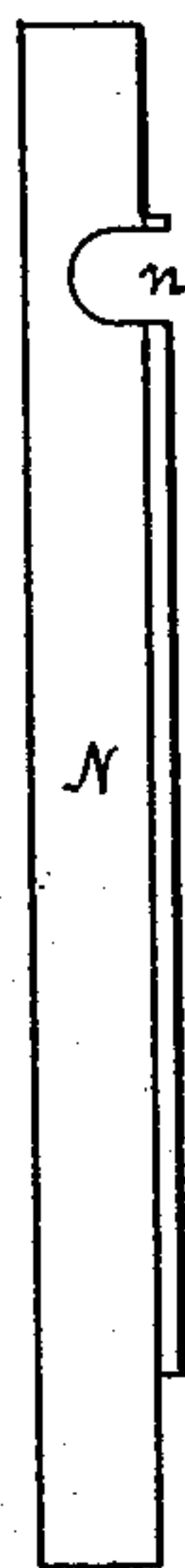
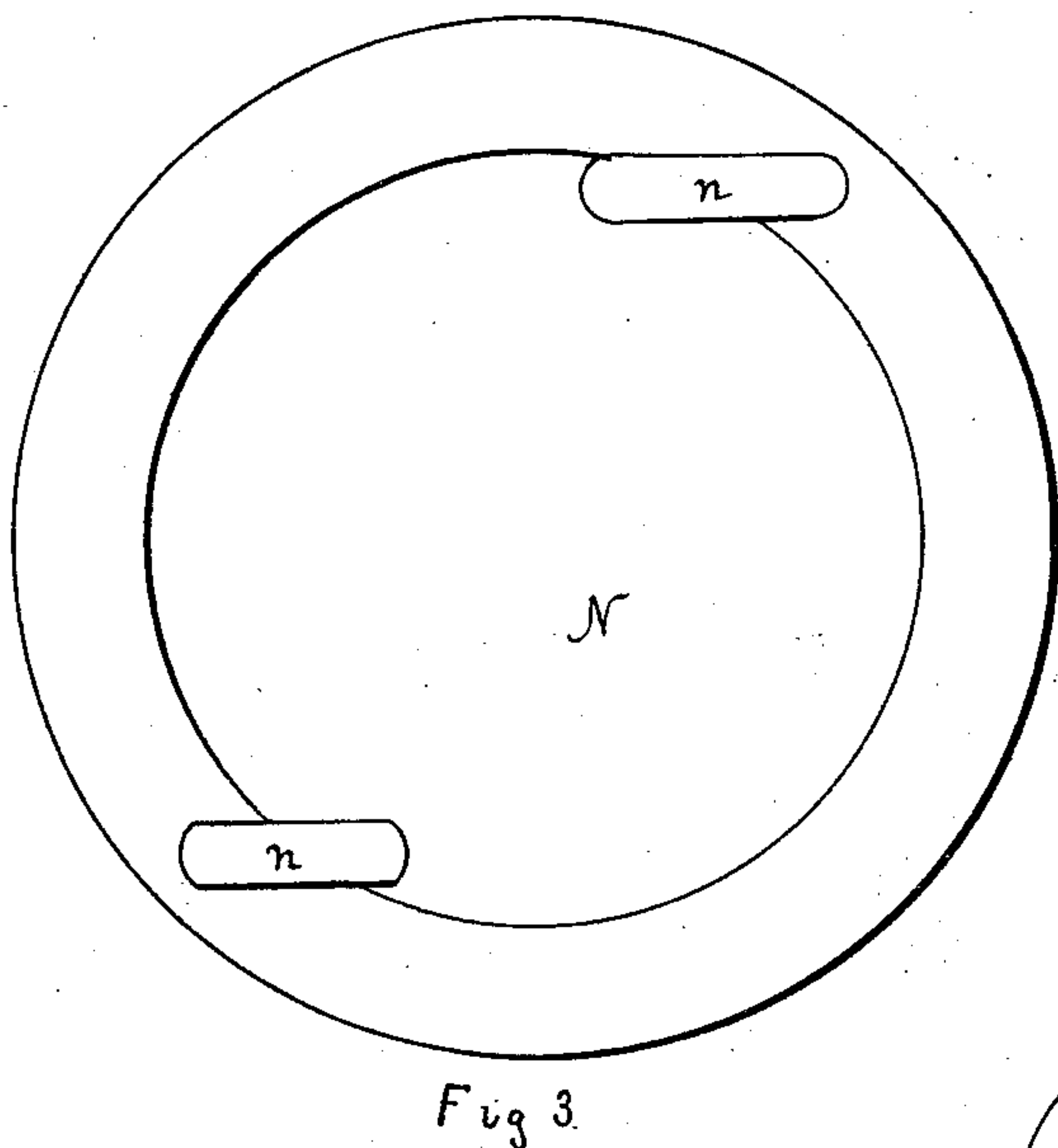
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UNITED STATES PATENT OFFICE.

JAMES H. MOORE, OF CRYSTAL FALLS, MICHIGAN, ASSIGNOR TO THE
GENETT AIR BRAKE COMPANY, OF SAME PLACE.

AIR-COMPRESSING PUMP.

SPECIFICATION forming part of Letters Patent No. 534,340, dated February 19, 1895.

Application filed November 3, 1891. Serial No. 410,804. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. MOORE, of Crystal Falls, in the county of Iron and State of Michigan, have invented a new and useful
5 Improvement in Air-Compressing Pumps, of which the following is a specification.

My invention consists in an improvement in air compressing pumps, particularly intended for use in air brakes where the pump
10 is driven from an axle instead of an independent steam engine, and is hereinafter fully described and claimed.

Figure 1 is a sectional end elevation of the pump, without the cylinder head or piston.
15 Fig. 2 is a side elevation of the pump with the governing cylinder and one of the suction valves in section. Fig. 3 is an inside elevation, and Fig. 4 is an edge elevation of one of the cylinder heads. Fig. 5 is a top plan view.

20 O represents an ordinary pump cylinder, provided with a piston having an ordinary piston rod P, and a cross-head *p* working on a fixed guide Q, to keep the piston rod in line.

MM represent the chambers of the suction
25 valves, which are cast on one side of the cylinder, and are each closed by a screw-cap I, and contain an ordinary puppet valve L, as clearly shown in Fig. 2. From these valve chambers ports *l* lead to the interior of the
30 pump cylinder, but instead of connecting directly therewith, they connect with small ports *n*, formed in the inside of the two cylinder heads, as clearly shown in Figs. 2, 3, and 4, whereby no clearance of the piston is
35 necessary, and the piston may be run close to the cylinder head, the object of this being to avoid compressing air uselessly. On the same side of the pump with the two suction valve chambers M is cast or formed or bolted
40 a governing cylinder E, closed at one end by a cap R and at the other end by cap R'. The upper end of this cylinder is bored out smaller than the lower end, and in it fits loosely a piston or plunger F, carrying a piston
45 stem or rod G, which projects through a cap K in cap R'.

The rings D D' may screw into cylinder E and between the rings D and D' is secured a diaphragm, C, closing the cylinder E under
50 the plunger F.

J represents a spiral spring encircling the

piston-rod G, abutting at one end against plunger F, and at the other end against cap K and tending normally to press the plunger F against the ring D'. By turning the cap 55 K, the tension of the spring J can be regulated to resist any desired pressure on diaphragm C.

H represents a U-shaped yoke or cross-head carried on piston-rod G, with its ends 60 under the suction valves L, so that when said yoke or cross-head is forced upward, it unseats both suction valves and holds them open.

B B represent two discharge valves which can be placed anywhere upon the cylinder, 65 but which, for ease in casting, are shown as placed upon the side of the cylinder opposite that on which the suction valve chambers M are formed. The ports *l'* of the discharge valves B connect with the ports *n* in the inside of the cylinder heads N N, as do the ports 70 *l* of suction valves L, and for the same reason.

A represents the discharge port of both discharge valves B, which may be an independent pipe connecting both valves, or may be 75 formed in the wall of the cylinder O, opening into a port A common to both valves B as indicated in Fig. 1, and this port A opens into cylinder E below diaphragm C.

a represents a passage through cap R, leading to any suitable reservoir for compressed 80 air (not shown in the drawing).

The operation of my invention is as follows: If it is desired to carry an air pressure of say twenty-five pounds per square inch in the reservoir, the spring J is compressed so that it 85 will resist a pressure of anything less than twenty-five pounds to the square inch on diaphragm C. When the pump is set in motion, all the valves will operate in the ordinary 90 manner of a double acting pump, until the air pressure in cylinder E in the reservoir equals twenty-five pounds, when the diaphragm C will be forced upward, carrying with it plunger F, piston-rod G, and yoke or cross-head H, 95 and through the medium of said yoke or cross-head will unseat both suction valves and hold them open so that air will be alternately drawn in and forced on through said valves without passing through the discharge valves B. This 100 will continue until the pressure of the cylinder E falls below twenty-five pounds, when

the spring J will return plunger F to the position shown in Fig. 2, and permit the pump to begin again compressing air.

5 The arrangement of the mechanism which I have herein shown simplifies and cheapens the mechanical construction now obtaining in pumps of this class, and unseats the suction valves L in a right line, avoiding the slight tilting which is liable to occur when they are
10 unseated by the action of the pivoted levers.

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

1. In an air compressing pump a governing cylinder connected with the discharge port, a
15 diaphragm within said cylinder, a spring resisting the motion of said diaphragm, a piston having a stem, and a rigid yoke directly connected to the stem of the piston and having projections located directly under the suc-
20 tion valves so as to unseat them, substantially as and for the purpose set forth.

2. The combination with the suction and

discharge passages of a forcing pump, and a valve controlling the suction passage, of a piston located below and adapted in its up- 25 ward movement to engage said valve, a spring to normally hold the piston out of engagement with the valve, and suitable connections leading from the discharge passage to the under side of the piston to convey pressure to the 30 piston and lift it into engagement with the valve, substantially as described.

3. The combination with the suction passage and its valve, of a governing cylinder connected with the discharge port, a diaphragm 35 within the cylinder, a piston arranged between the diaphragm and valve and adapted to directly engage the latter, and a spring to hold the piston normally out of engagement with the valve, substantially as described.

JAMES H. MOORE.

Witnesses:

MOSES L. ROTHSCHILD,
GERTRUDE H. ANDERSON.