

G. W. & W. H. LEIMAN,
AIR COMPRESSOR OR BLOWER.
APPLICATION FILED JUNE 3, 1908.

925,203.

Patented June 15, 1909.

Fig. 1. B

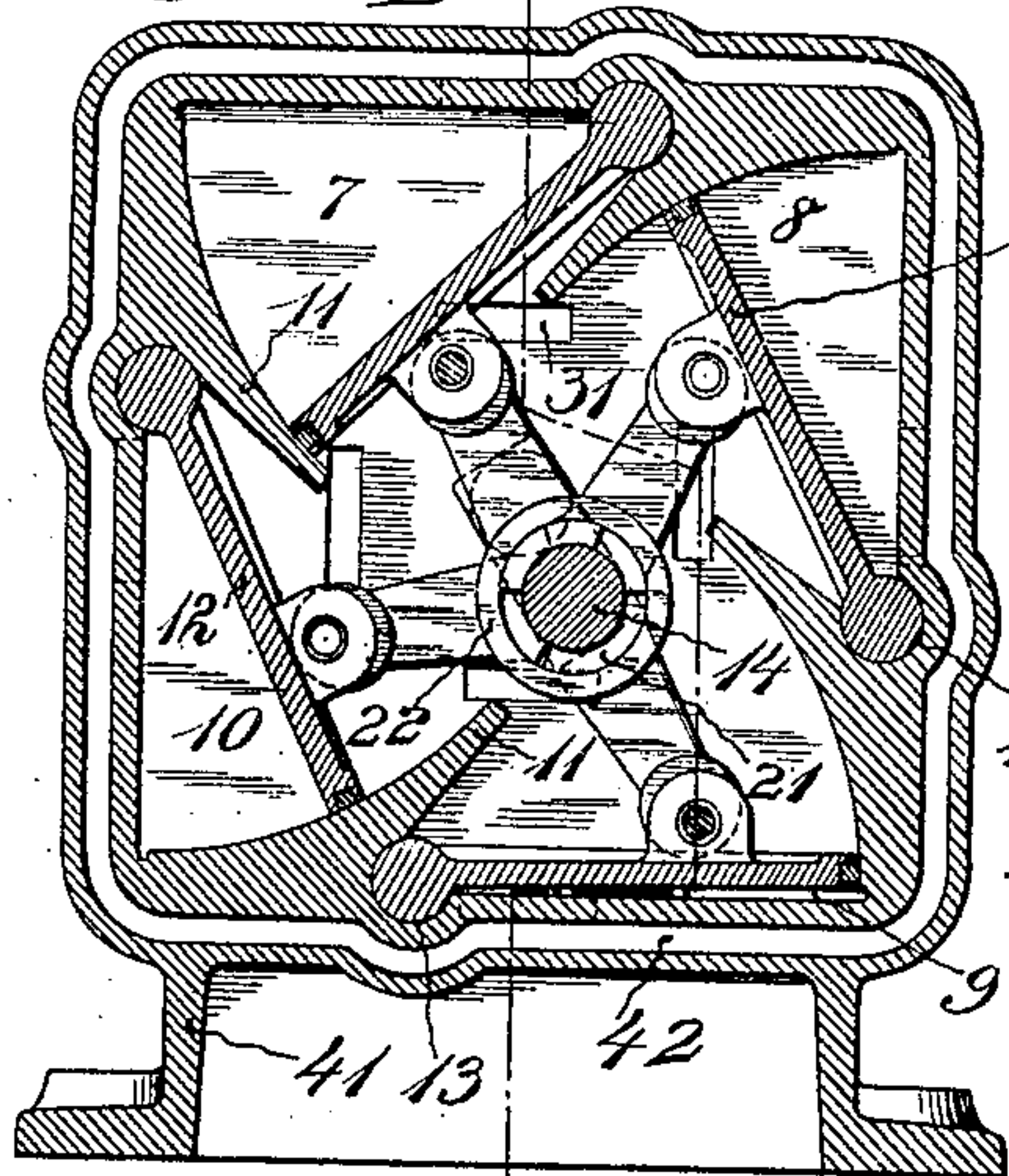


Fig. 2. A

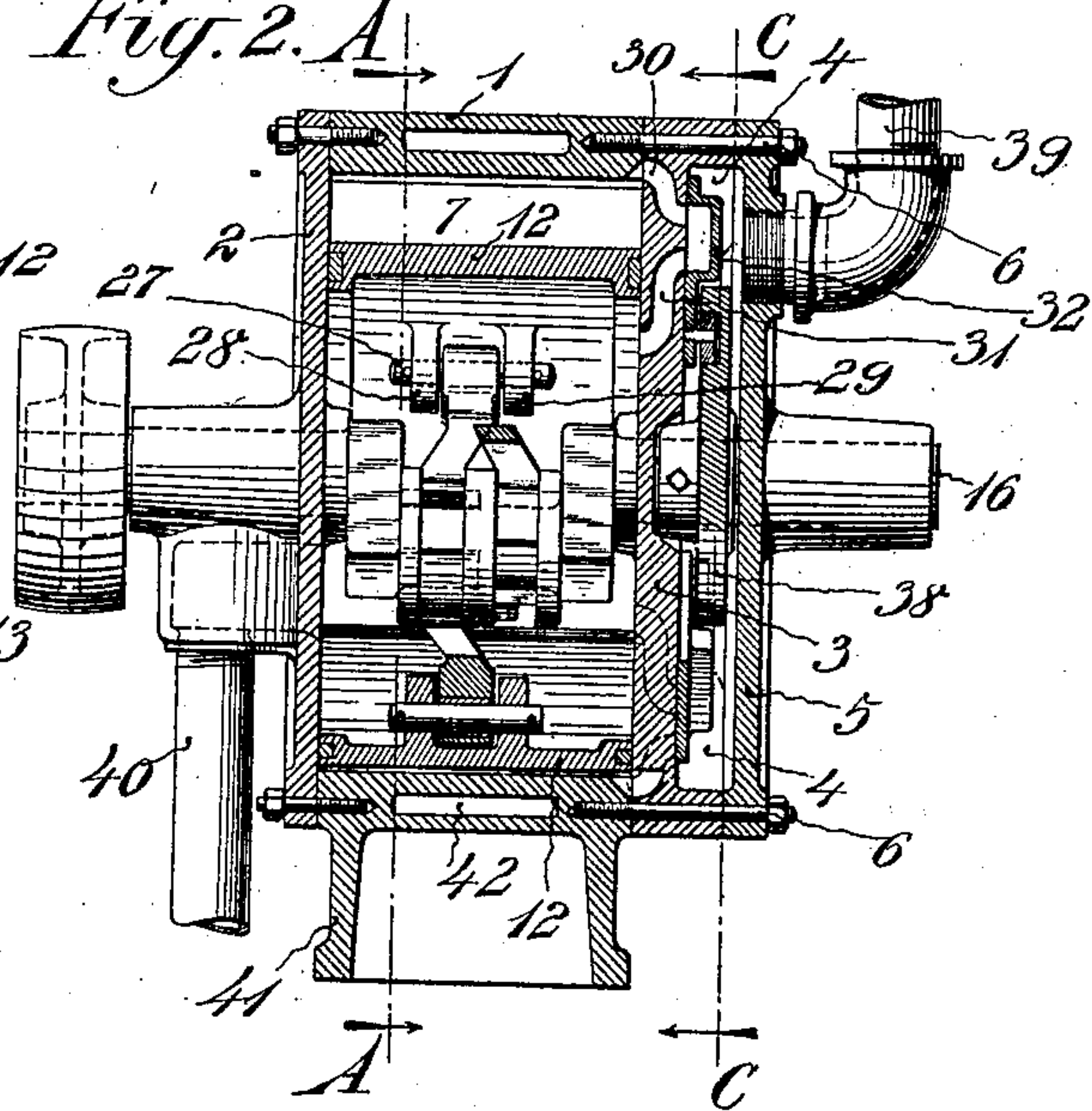


Fig. 3. B

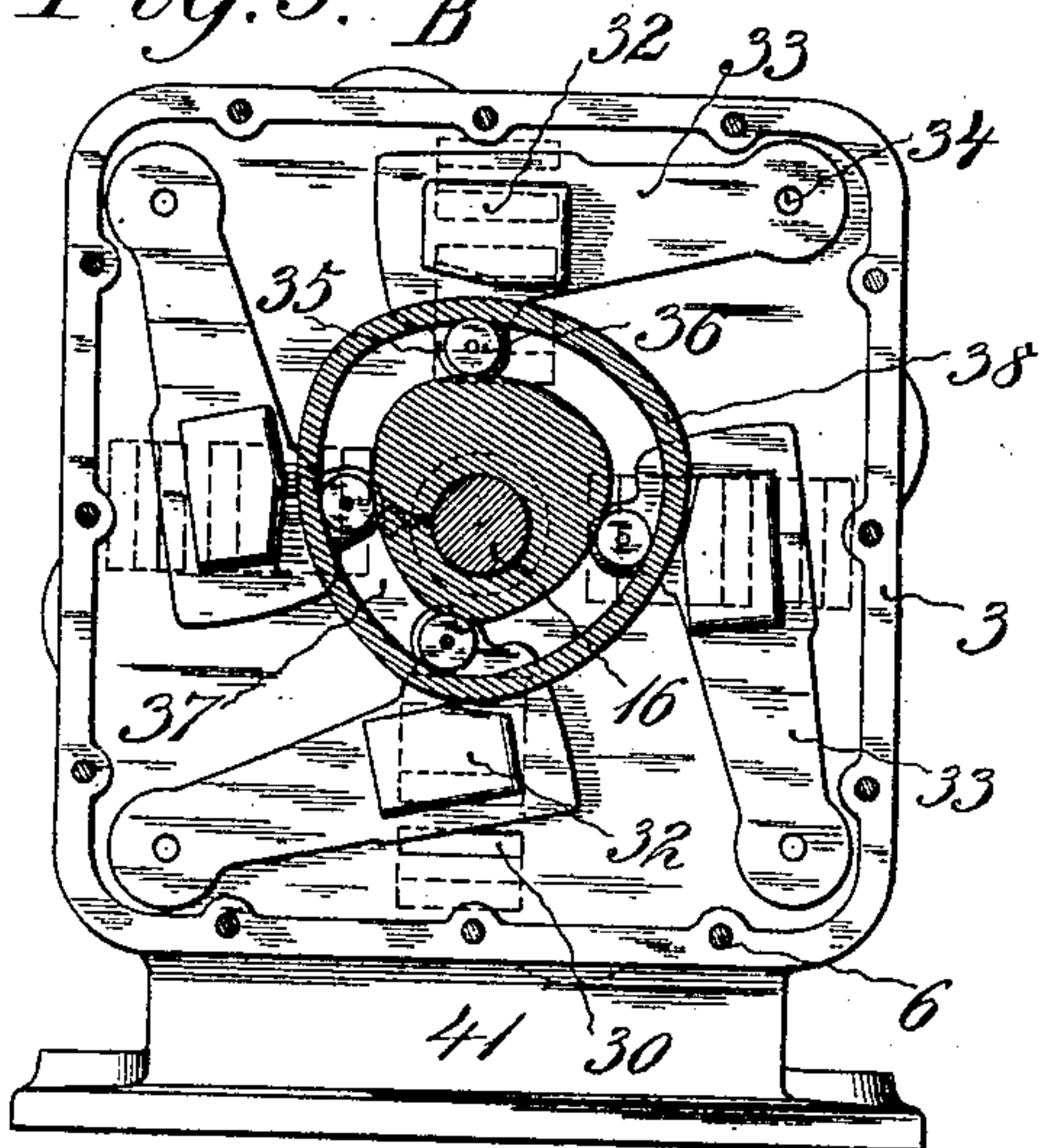


Fig. 5.

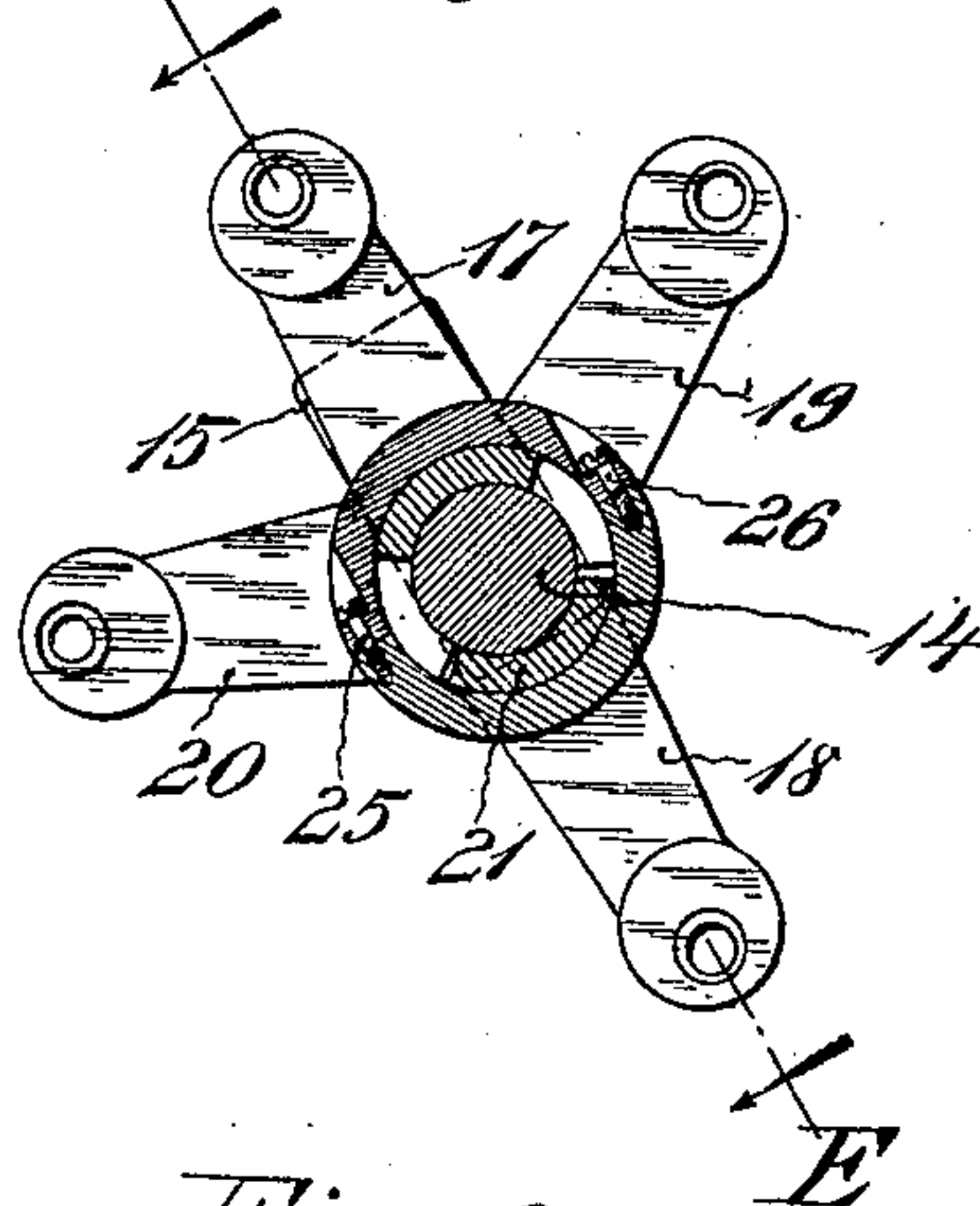


Fig. 4.

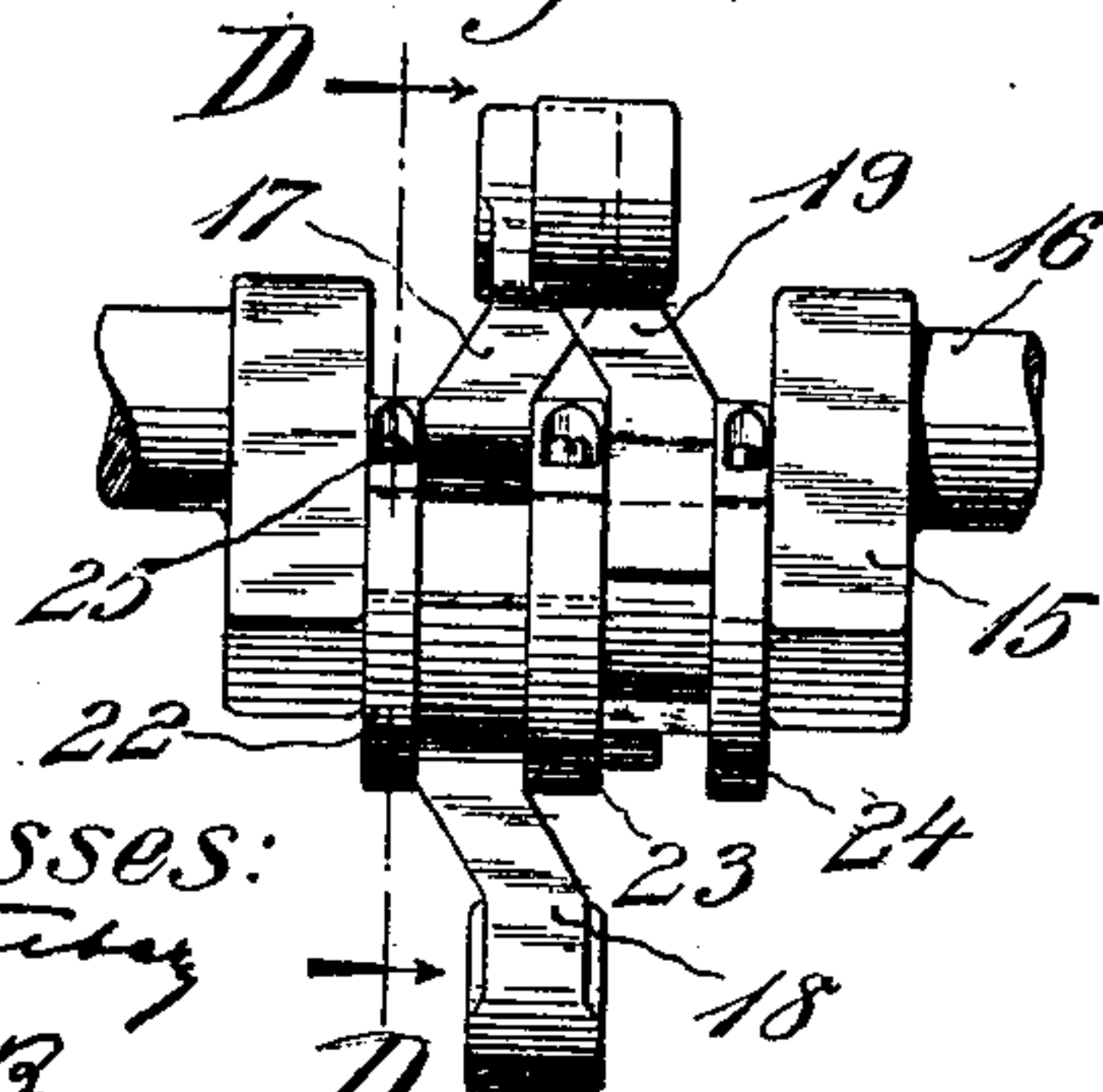
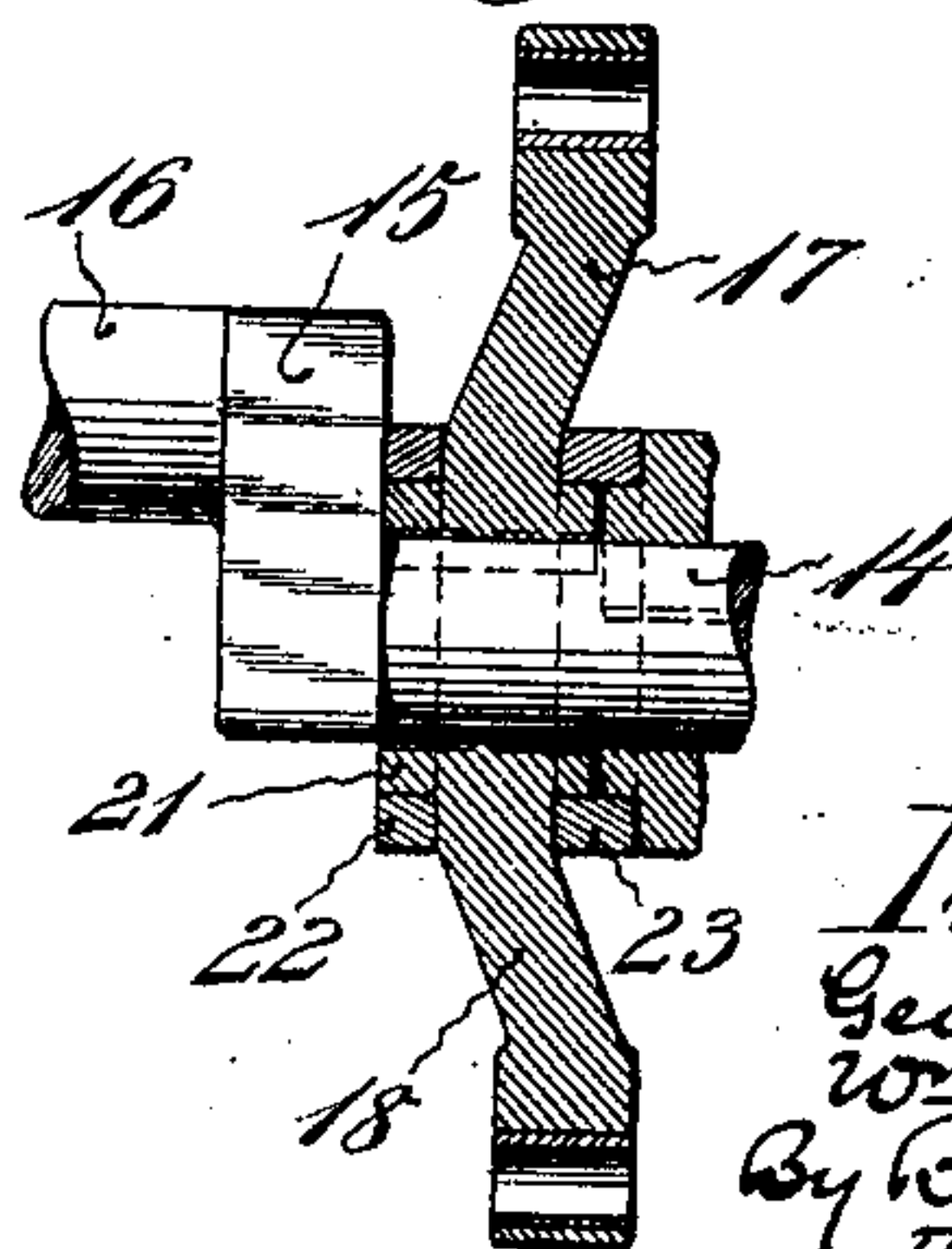


Fig. 6.



Witnesses:

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Wm. H. Leiman
By Brown & Davis
their attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. LEIMAN AND WILLIAM H. LEIMAN, OF NEWARK, NEW JERSEY.

AIR COMPRESSOR OR BLOWER.

No. 925,203.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed June 3, 1908. Serial No. 436,435.

To all whom it may concern:

Be it known that we, GEORGE W. LEIMAN and WILLIAM H. LEIMAN, citizens of the United States, and residents of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Air Compressor or Blower, of which the following is a specification.

This invention relates to an air compressor or blower and more particularly to an air compressor or blower in which the air is drawn into or expelled from the compressor or blower by vibrating the flaps or pistons, the object being to provide improved means for operating the vibrating flaps or pistons and for operating valves to open and close the admission of air to and its escape from the air chambers.

In the accompanying drawings, Figure 1 is a vertical section of the air compressor or blower in the plane of the line A—A of Fig. 2, Fig. 2 is a section of the same in the plane of the line B—B of Fig. 1, Fig. 3 is a section taken in the plane of the line C—C of Fig. 2, Fig. 4 is a view in detail of the crank and links for operating the several flaps or pistons, Fig. 5 is a similar view in the plane of the line D—D of Fig. 4, and Fig. 6 is a similar view in the plane of the line E—E of Fig. 5.

Attention is called to applicant's co-pending application Serial No. 380,796.

The frame or casing of the compressor or blower is made up of an open ended central portion 1 preferably of rectangular form, the ends of the central portion 1 being closed, the one by a covering plate 2 bolted to the section 1 and the opposite end by a ported plate 3 dished to form a valve chamber 4 and in turn covered by a plate 5 bolted through the ported plate 3 to the central section 1 by bolts 6.

The central section is divided into several chambers, in the present instance four chambers, one at each curve of the central section 1, and denoted, respectively, by 7, 8, 9 and 10. These chambers are separated by curved faced internally projecting lips 11, the curved face of each lip being toward the interior of the chamber.

The pistons or flaps 12, one for each chamber, and quite similar in their construction, are hinged in sockets 13 at the bases of the lips 11 so as to swing inwardly into close proximity to the bottom of the chamber formed by the wall of the central section 1

and outwardly with their free ends packed and in air-tight engagement with the curved faces of the lips 11. These flaps or pistons are operated by links, one for each, mounted loosely on the crank pin 14 on the crank 15 of the shaft 16, the said crank or double crank, in the present instance being located in the interior of the central section 1 of the casing and the shaft itself extending through suitable packing boxes through the end closures 2, 3 and 5.

The links for operating the diagonally opposite pistons or flaps in the chambers 7 and 9 are denoted by 17, 18, and the links for operating the pistons or flaps in the diagonally opposite chambers 8 and 10 are denoted by 19, 20. The links are provided with partial hubs 21, the interior faces of which fit the exterior of the crank pin 14 and the exterior faces of which are made to conform to the interior of retaining rings 22, 23, and 24, (see Fig. 4) the said rings being formed in half sections and united by screws 25, 26, to permit the ready assembling of the links within the casing section 1 on the crank pin.

Each pair of links 17, 18, and 19, 20, has the outer ends of the members of the pairs off-set toward the plane of the outer ends of the opposite pair so that while they occupy consecutive positions on the crank pin, their outer ends are attached to the backs of the flaps or pistons at points approximating the middle points between the opposite edges of the flaps or pistons.

The engagement of the links with the backs of the pistons is effected by means of pins 27 which pass through the holes in the outer ends of the links and through lugs 28, 29, formed on the backs of the pistons.

As the shaft 16 rotates, the crank pin 14 will consecutively force the flaps or pistons toward the bottoms of the chambers expelling the air therethrough and will successively open the said pistons away from the bottoms of the chambers.

The ported end plate 3 is provided with a pair of ports for each chamber, one port passing from the valve chamber 4 into the air chamber within the casing 1 and beneath the flap or piston and another port 31 of the pair passing from the valve chamber 4 into the interior of the casing 1 back of or within the space partially surrounded by the several flaps or pistons 12. The several pairs of ports in the ported plate 3 are covered by

swinging valves, one for each pair, and quite similar in construction. The valve for the ports 30 and 31 consists of an elongated flat plate having a cove portion 32 for bridging the two ports 30 and 31, as clearly shown in Fig. 2, and a stem portion 33 pivoted to the ported plate 3 at 34. This valve also has an extension 35 carrying an anti-friction roller 36 which travels in a cam groove 37 in a cam 38 fixed to rotate with the shaft 16 within the valve chamber 4. In like manner, each of the other pairs of ports for the respective air chambers is provided with its swinging valve operated by the same cam 38 and constructed and mounted in the same manner as that hereinbefore described, for the ports 30 and 31.

The chamber 4 is provided with an outlet pipe 39 leading therefrom and the space partially surrounded by the vibrating flaps or pistons 13 is provided with an inlet pipe 40 for admitting air freely through the end cover 2 of the casing into the interior space within the casing.

The central portion 1 of the casing may conveniently be provided with a pedestal 41 for fastening it in an upright position on any suitable support and the interior of the casing 1 may be provided with a port 42 for circulating a cooling medium in any well known or approved manner.

In operation, the cam 38 is so timed with respect to the several flaps that they will occupy the position shown in Fig. 2, while the pistons or flaps are being opened away from the bottoms of the chambers, thereby permitting air to freely pass from the interior space, partially surrounded by the flaps to the interior of the chamber, beneath the flap, but when the flap or piston is being forced toward the bottom of the chamber to compress the air therein, the cam 38 will have rocked the valve into the position shown at the bottom of Fig. 3, where it will open the port 30 to the interior of the chamber 4 and close the interior of the chamber to the port 31 thereby permitting the air to

escape first from the compression chamber within the casing 1 into the valve chamber 4 and thence through the exit pipe 39 to the point where it is to be stored or used. When four of these compression chambers are in operation at the same time, two of them will be discharging air into the chamber 4 while another two will be refilling from the air within the space partially surrounded by the pistons or flaps.

The structure is a simple one, to a very marked extent free from noise in operation, and wear and tear is but slight.

What we claim is:—

1. In an air compressor or blower, in which vibrating flaps or pistons are employed, a rotary shaft provided with means for operating the vibrating flaps or pistons for drawing air into and expelling it from air chambers, a valve chamber provided with ports leading to the several air chambers and to the space partially surrounded by the vibrating flaps or pistons, valves for opening and closing said ports and means connected with the rotary shaft for operating said valves.

2. In an air compressor or blower in which vibrating flaps or pistons are employed within a casing provided with air chambers, a rotary shaft provided with means for operating the vibrating flaps or pistons, a valve chamber provided with ports leading to the air chambers and to the space partially surrounded by the vibrating flaps or pistons, swinging valves for opening and closing said ports and a cam carried by the rotary shaft within the valve chamber for swinging the said valves at the proper times.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two witnesses, this second day of June 1908.

GEORGE W. LEIMAN.
WILLIAM H. LEIMAN.

Witnesses:

F. GEORGE BARRY,
HENRY THIEME.