J. H. DAILEY.

AIR COMPRESSOR.

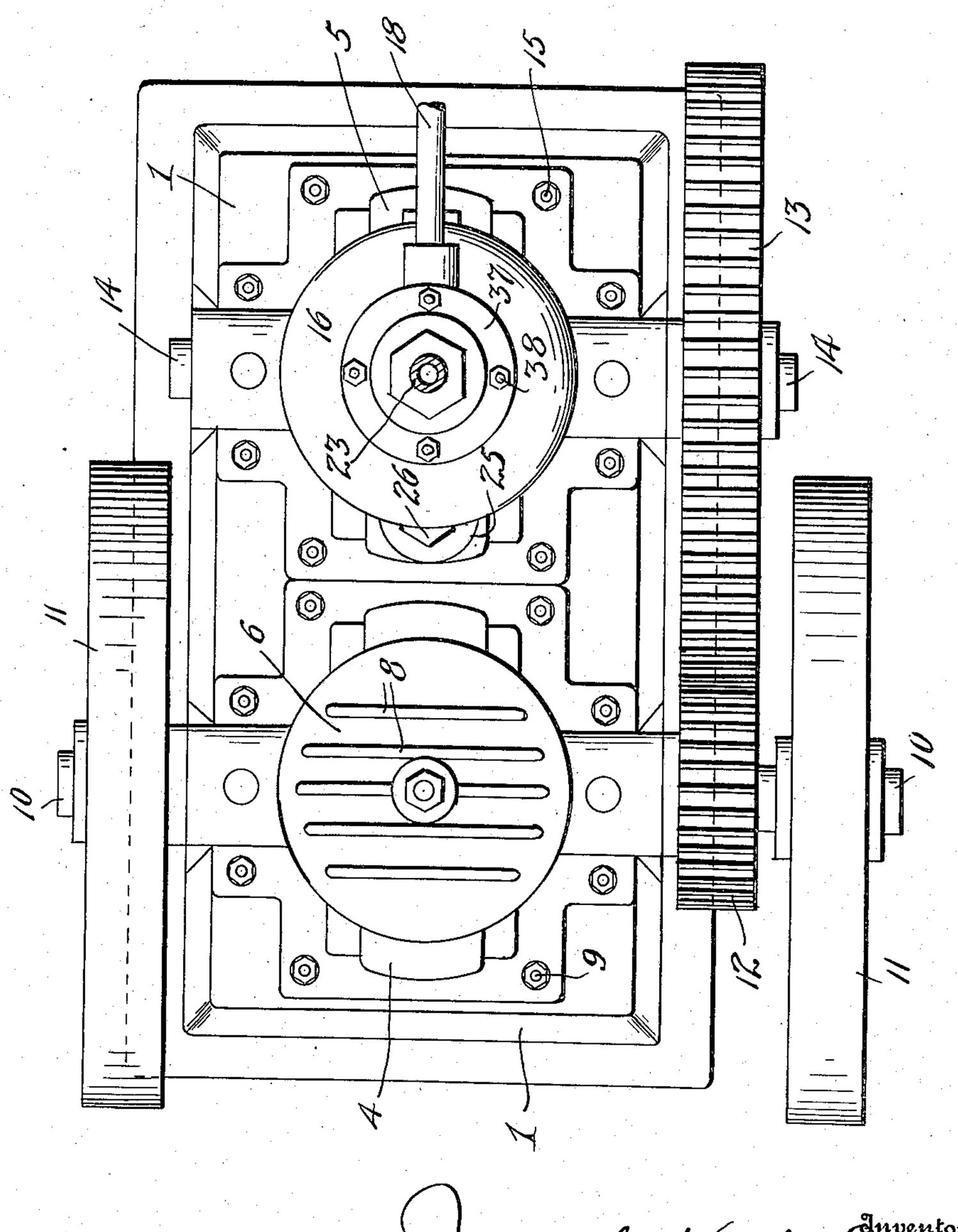
APPLICATION FILED APR. 10, 1909.

936,609.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 1.

FIG. 1



Witnesses

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3 SHEETS—SHEET 2.

FIG. 3

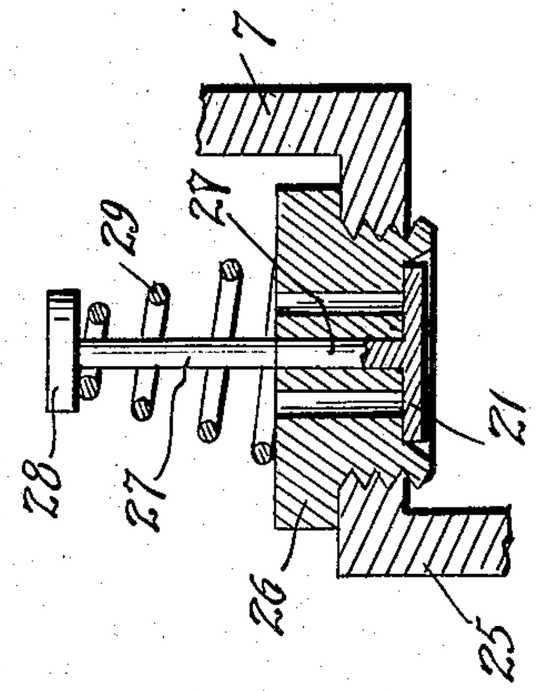
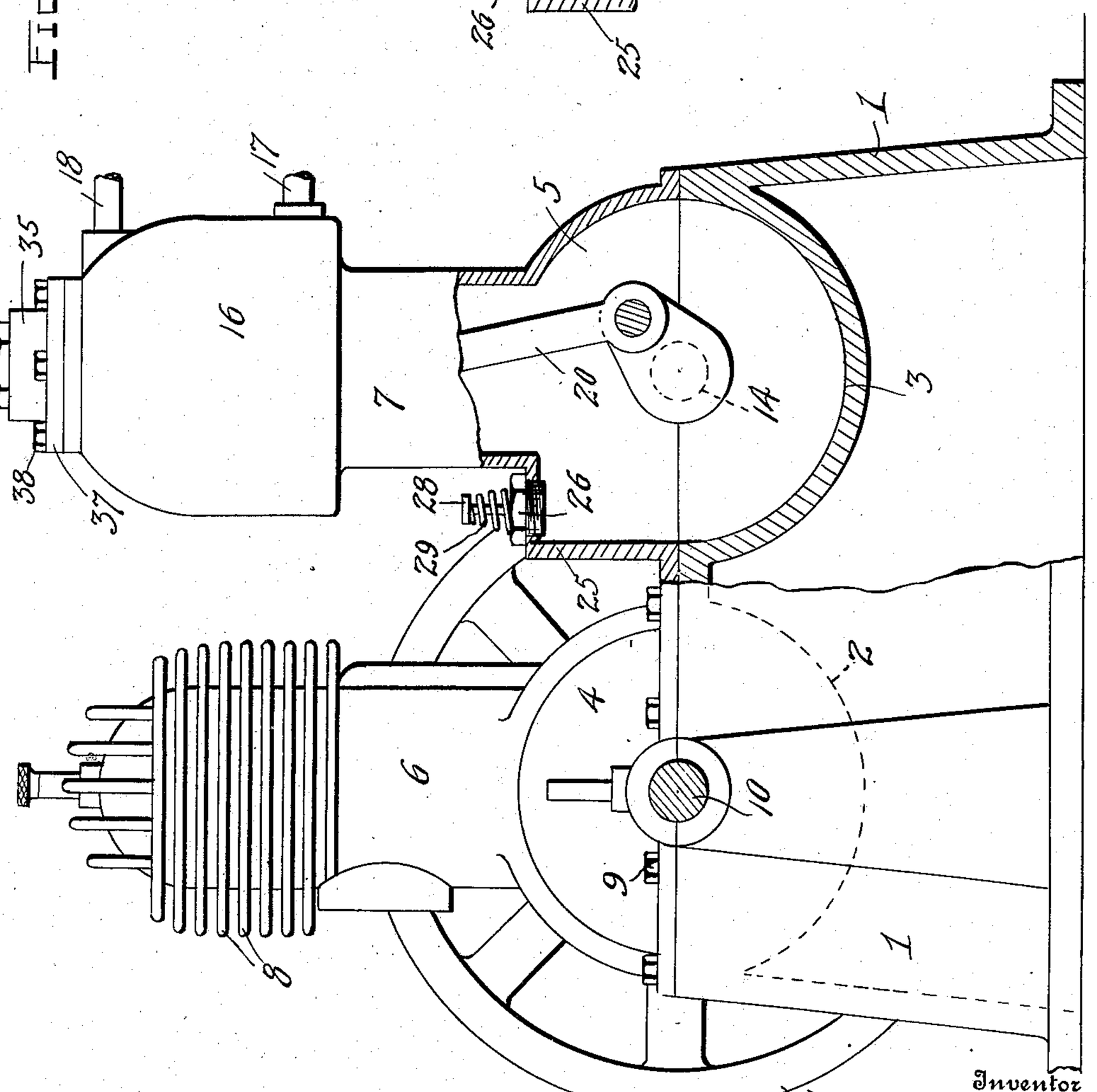


FIG. 2.



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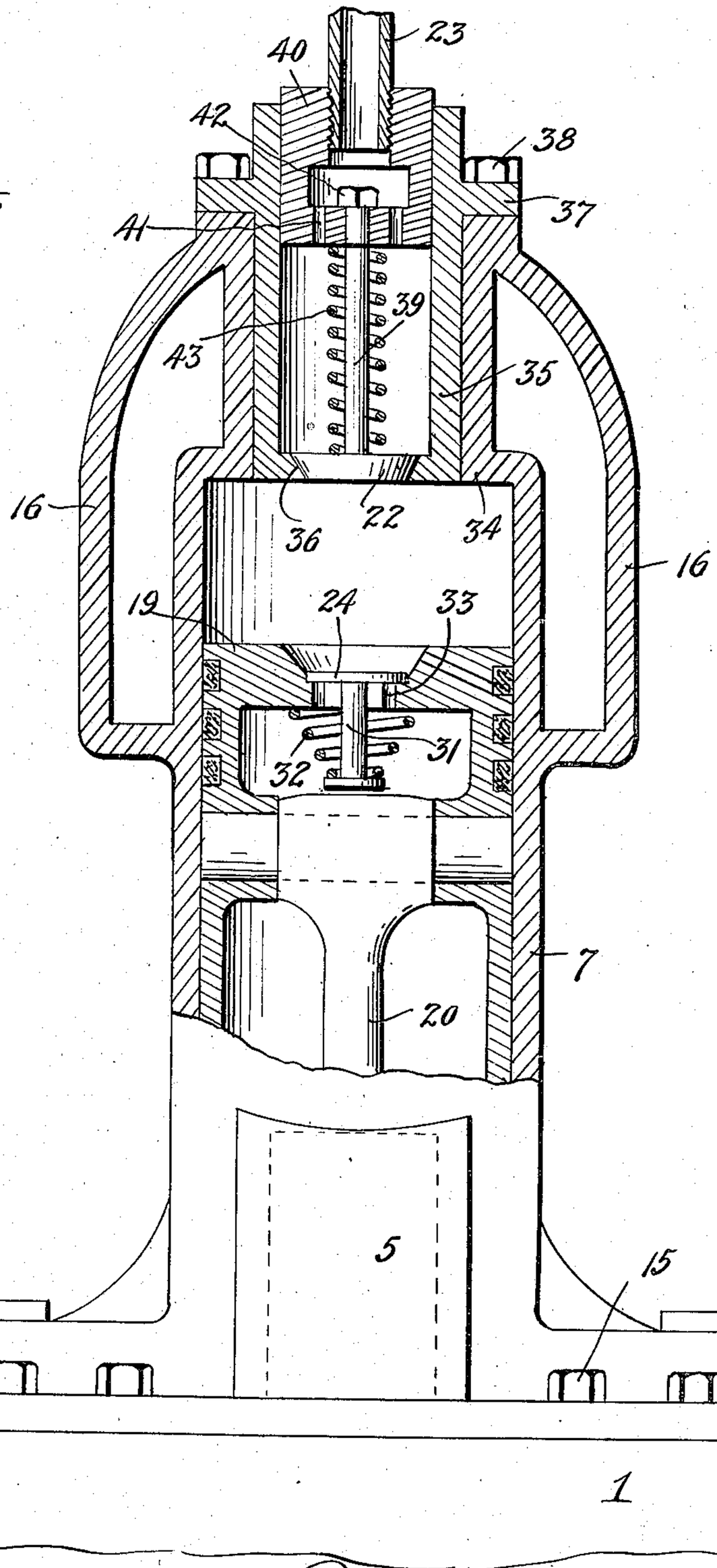
3 SHEETS—SHEET 3.

FIG. 4



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UNITED STATES PATENT OFFICE.

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AIR-COMPRESSOR.

936,609. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed April 10, 1909. Serial No. 489,047.

To all whom it may concern:

Be it known that I, JOSEPH HERBERT DAILEY, a citizen of the United States, residing at the town of Wilson, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

This invention relates to improvements in air compressors and more particularly one adapted to be driven by a gasolene engine and used for compressing air in a closed liquid tank containing a tree spraying mixture.

The object of the invention is to improve and simplify the construction and operation of air compressors, and to provide one which may be produced at a comparatively small cost and which will be highly efficient in use.

With the above and other objects in view, the invention consists in the novel features of construction and the combination and arrangement of parts, hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of the improved air compressor; Fig. 2 is a side elevation of the same with parts removed and parts in section; Fig. 3 is an enlarged detail sectional view through the inlet valve; and Fig. 4 is a partial end elevation showing the cylinder and piston of the air compressor in section.

Referring more particularly to the drawings, 1 denotes a hollow cast metal base having in its top two depressions or chambers 2, 3 which form the lower sections of the crank chambers 4, 5 of a gasolene engine 6 and an air compressor or pump 7, respectively. The engine 6 has its cylinder provided upon its exterior with heat radiating ribs or flanges 8, and it is formed integral with the upper section 4 of its crank chamber which latter has a flanged bottom edge bolted as shown at 9, upon the top of the base over the depression 2. The crank shaft 10 of the engine has upon its ends fly wheels 11, and it also has fixed to it a pinion 12 which meshes with a gear 13 fixed to the crank shaft 14 of the compressor 7. The latter has its cylinder formed integral with the upper section 5 of its crank chamber which also has a flanged bottom edge bolted as at 15 upon the base over the depression 3. The upper portion of the compressor cylinder is surrounded by an integral water jacket 16 having flow and return pipes 17, 18.

19 denotes a valved piston mounted for reciprocation in the cylinder of the compressor and connected by a pitman 20 to the crank of the shaft 14. Upon the upstroke of this piston air is drawn into the crank chamber or casing 5 through an inlet valve 21 and the air in the cylinder above the piston is forced through an outlet valve 22 in the top of the cylinder and from said valve 22 through a discharge pipe 23 which may lead to an air-tight liquid tank containing a mixture for spraying trees. Upon the downstroke of said piston the air below the same passes through its valve 24 into the upper portion of the cylinder. For the purpose of supporting the air intake valve 21, an enlargement 25 is formed in the upper section of the crank chamber 5 and provided with a threaded opening to receive a screw plug 26 which carries the valve and forms a seat for the same. The valve 24, as more clearly shown in Fig. 3, is in the form of a disk fixed to the lower end of the stem 27 which slides through a central opening in the plug 26 and has upon its projecting outer end a stop head 28 and a surrounding coil spring 29. The latter holds the valve upon its seat so that it normally closes a plurality of air inlet openings 30 formed in the plug. The valve 24 in the piston is similar to the one just described and is in the form of a disk fixed to the upper end of a stem 31 which slides in a central opening in the closed upper end of the piston 19, as clearly shown in Fig. 4. A coil spring 32 surrounds the stem 31 and engages a stop head upon its lower end whereby the valve is held normally in a depression or seat in the top of the piston and over a plurality of air passages or openings 33.

The upper end of the air compressor cylinder has a reduced portion 34 in which is removably secured a tubular member 35 forming a casing and seat for the outlet valve 22. Said member 35 is in the form of a hollow cylinder having at its lower end a cone-shaped valve seat proper 36 and at its upper end a flange 37 which is secured by bolts 38 to the top of the compressor cylinder, as clearly shown in Fig. 4. Said valve 22 is in the form of a cone-shaped disk adapted to engage the seat 36 and secured upon the lower end of a stem 39 arranged

for sliding movement in a bushing or plug 40 arranged in the upper end of the member 35. Said plug 40 is hollow and has the pipe 23 screwed into its top. Its bottom has a central guide opening for the valve stem 39 and a plurality of openings 41 forming air passages. Upon the upper extremity of the stem 39 is a nut 42 and upon its lower portion is a coil spring 43 which actuates the valve 22 to its closed position.

In operation, when the gasolene engine is running the motion of its shaft 10 will be imparted to the air compressor shaft 14 by means of the gearing 12, 13. Upon the upstroke of the piston 19 of the compressor, air will be sucked into the crank casing 5 through the intake valve 21 and the air in the compressor cylinder above the piston will be forced by the latter through the valve 22 and the pipe 23, the valve 24 in the piston remaining closed. Upon the downstroke of the piston 19 the valves 21 and 22 will remain seated and valve 24 will open to permit the air to pass upwardly through the piston from the crank casing 5 to the top of the compressor cylinder.

While the preferred embodiment of the invention has been shown and described in detail, it will be understood that various changes in the details of construction and in the form, proportion and arrangement of parts may be resorted to without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim is:

1. In an air compressor, the combination of a cylinder having a closed crank chamber formed with the enlargement 25, the latter having a horizontal portion formed with a screw-threaded opening, the removable plug 26 having a reduced screw-threaded portion to enter said opening and an enlarged flat-faced upper portion, said plug being formed with a central guide opening and an annular series of air inlet openings, said plug being also formed with a flat top and a recessed bottom, a valve stem in said guide opening, a disk valve on the lower end of the stem to enter the recess in the bottom of the plug and close said inlet openings, a head upon the upper end of the stem, a cone-shaped coil spring upon the stem between the head and the flat top of the plug, an outlet valve at the other end of the cylinder, a valved piston in the cylinder, and a crank shaft in the chamber and operatively connected to the piston.

2. In an air compressor, the combination of a cylinder formed with the reduced cylindrical end 34, the hollow cylindrical member 35 arranged in said reduced end and formed with an annular flange secured to the flat outer extremity of said reduced end of the cylinder, said member having a concentric bore of uniform diameter and a closed lower end formed with a beveled valve seat, the hollow plug 40 secured in the upper end of said member and having at its top a reduced opening to receive an outlet pipe and at its lower end a closed bottom formed with a central guide opening and an annular series of outlet openings, a valved stem to slide in said guide opening, a beveled edge valve upon the lower end of the stem to engage said valve seat, a head upon the upper end of the stem within said hollow plug, a coil spring upon the stem between the valve and said member, a valved piston in the cylinder and means for actuating said piston.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH HERBERT DAILEY.

Witnesses:
O. C. DOUGLAS,
DONALD S. MOORE.