

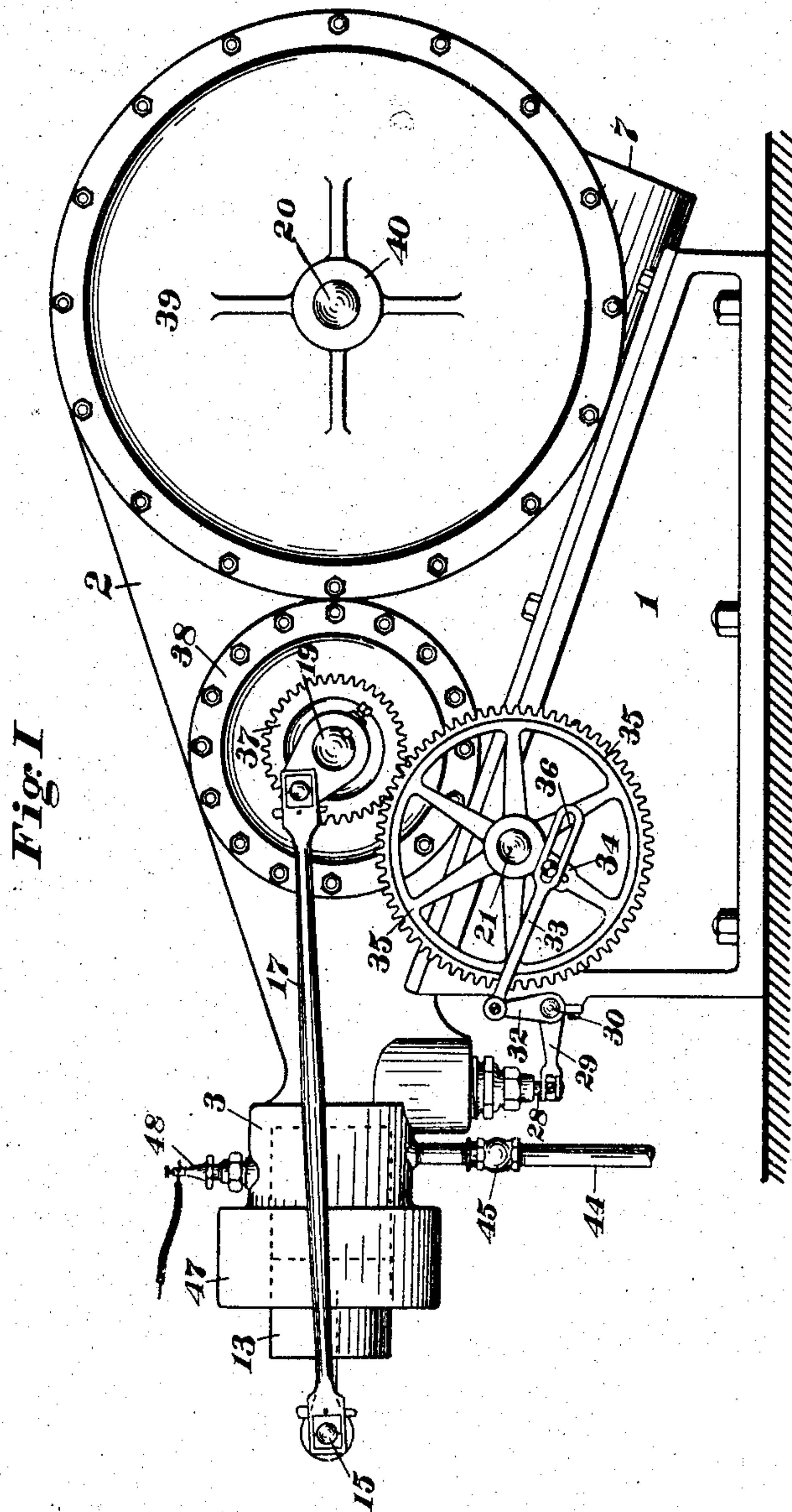
No. 790,018.

PATENTED MAY 16, 1905.

G. A. ALDRICH.
GAS ENGINE.

APPLICATION FILED MAY 19, 1903.

2 SHEETS—SHEET 1.



WITNESSES:

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Wilson D. Bent

INVENTOR:

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2 SHEETS—SHEET 2.

Fig. II

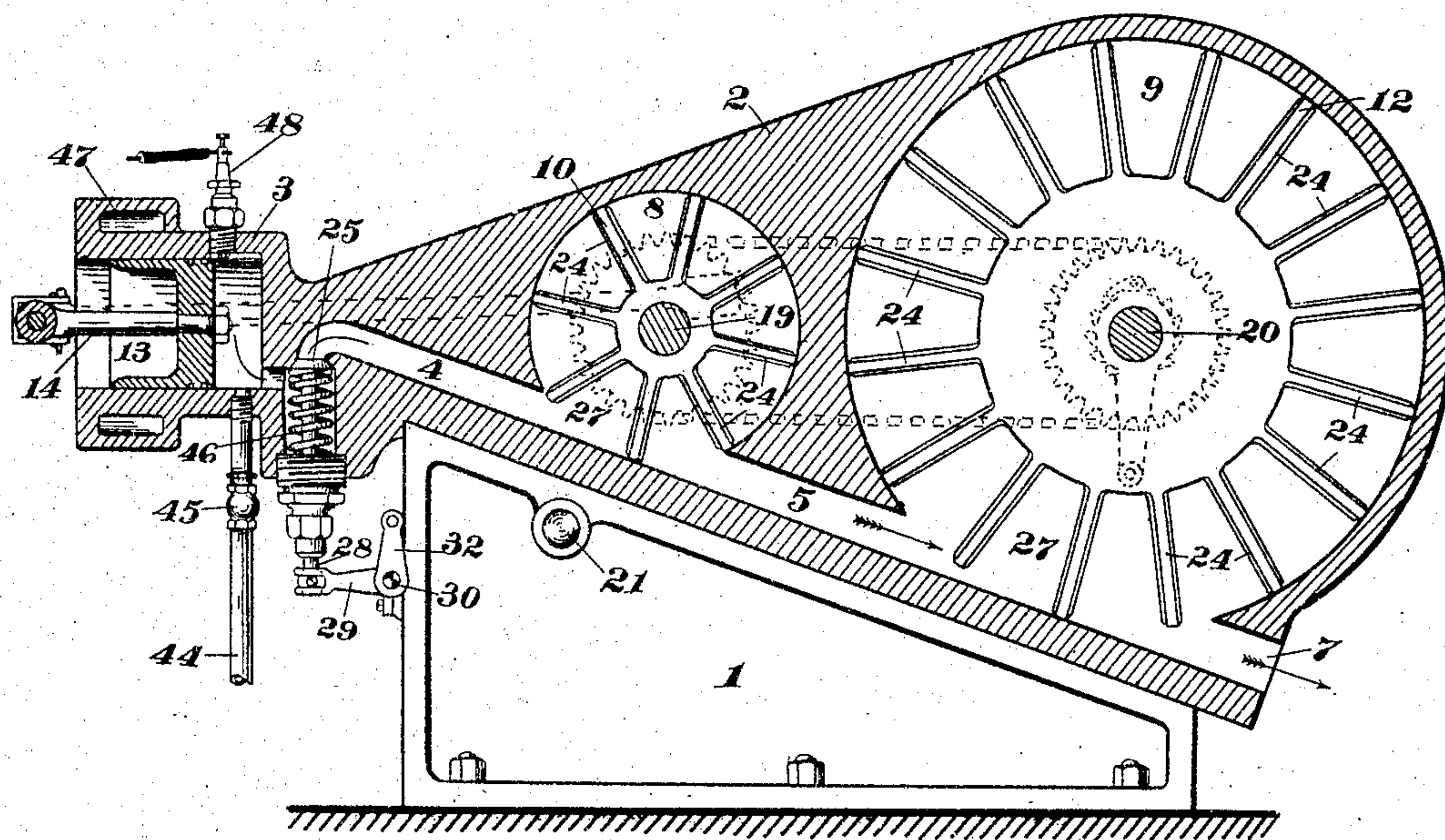
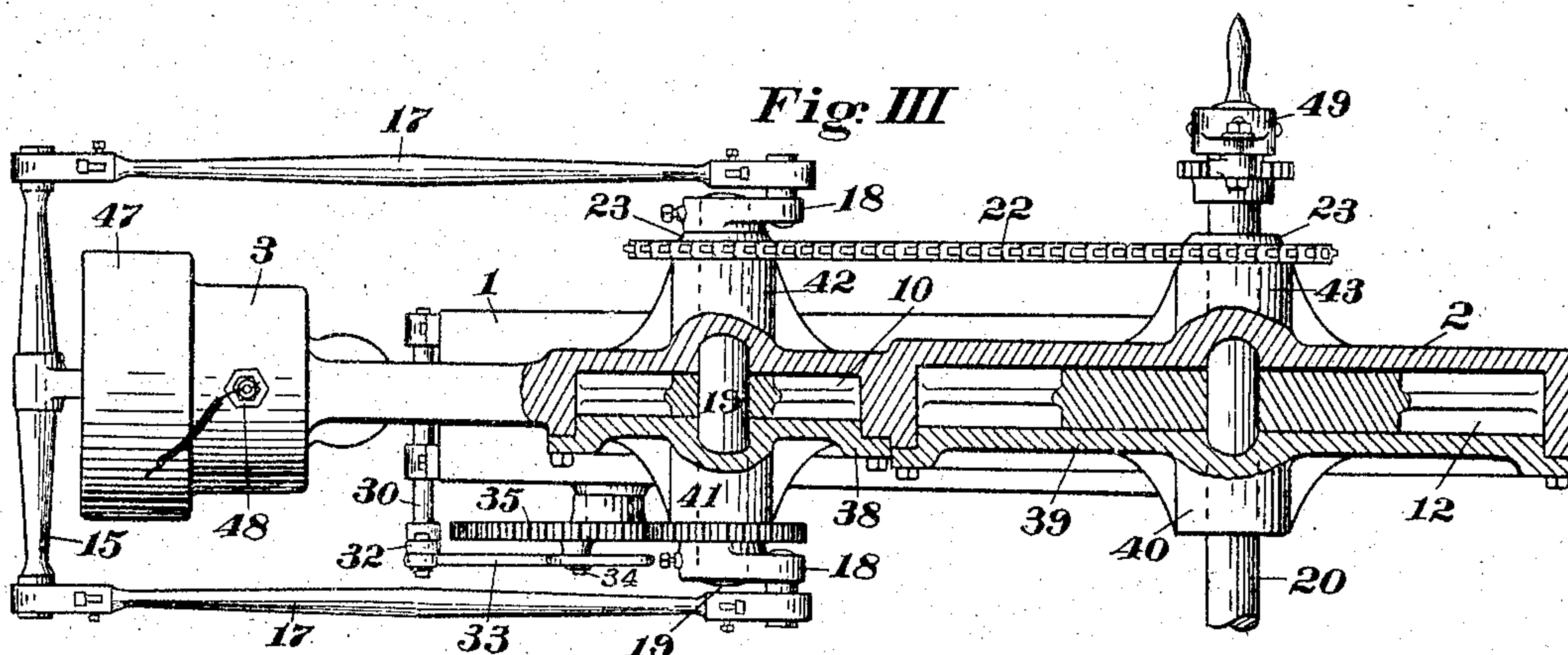


Fig. III



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UNITED STATES PATENT OFFICE.

GEORGE ALBERT ALDRICH, OF SAN FRANCISCO, CALIFORNIA.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 790,018, dated May 16, 1905.

Application filed May 19, 1903. Serial No. 157,843.

To all whom it may concern:

Be it known that I, GEORGE ALBERT ALDRICH, a citizen of the United States, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Gas - Engines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to gas or other elastic-fluid engines and to certain useful improvements therein.

These improvements consist in the construction, arrangement, and relation of parts and special means to utilize the impulsive force of the waste gases, to muffle the noise thereof by means of rotary undershot impulse-wheels, that also perform the function of crank and fly wheels, and to clear the cylinder and combustion-chamber from residual gases.

The objects of my invention are to attain by a simple and inexpensive construction a motive engine of the class described that will utilize the pressure and impulsive force of the escaping gases; also, to avoid the noise of their escape and to scavenge or clear the chambers at certain stages of the mechanical effect.

To these ends I construct gas, explosion, or steam engines, one of which is shown in the drawings herewith and forms a part of this specification.

Figure I is a side elevation of an engine constructed with my improvements; Fig. II, a longitudinal section through the same engine; and Fig. III, a plan view thereof, partly in section.

In the drawings the bottom subframe 1 is of a box form, answering to support the engine-frame 2 and its connected parts at a convenient height above the foundation. The main engine-frame 2 is preferably made integral with the motive cylinder 3 and is provided with passages 4, 5, and 7 of increasing area for the escaping spent gases, also has circular chambers 8 and 9 to receive the impulse-wheels 10 and 12, as shown in Fig. II. The motive cylinder 3 is open-ended and inverted from the usual position on its frame with its open end forward and contains the

usual piston 13, connected by the strut 14, cross-bar 15, and rods or links 17 to the cranks 18 on the shaft 19, as seen in Figs. II and III. On a series of shafts parallel to 19 I place one or more impulse-wheels 12, according to the volume of the gases to be dealt with, one only being shown in the drawings. This shaft 20 is connected by a chain 22 and sprocket-wheels 23 or other positive gearing to the first shaft 19, so the impulse-wheels will revolve at the same rate of revolution, but with different peripheral velocity, in proportion to their relative diameters. These impulse-wheels besides performing the functions of crank and fly wheels are provided with vanes 24, that project into the tangential passages 4 and 5 and receive at the bottom the impulsive force of the waste gases that escape from the cylinder 3 through the exhaust-valve 25.

The impulsive action of the exhausted gases being intermittent and occupying but a portion of the whole time and the motion of the wheels 10 and 12 being continuous, these latter act as pumps to clear the cylinder 13 of residual gases.

The difference in size of the wheels and in the spaces 27 between the vanes 24 conform approximately to the theory of the expansion of waste gases, which by this construction of parts are baffled and diffused, so as to prevent the usual noise that occurs when such gases escape directly into the air. The eduction or exhaust valve 25 is actuated by a stem 28 and lever 29 on an oscillating shaft 30, operated by a lever 32 and link 33, that connects to a crank 34 on the gear-wheel 35, a slot 36 in this link 33 permitting the required pause and sequence of movement for the valve 25, the whole arranged as seen in Figs. I and III.

The wheel 35 revolves loosely on a stud 21 in the main frame 2 and is driven from the crank-shaft 19 by a second gear-wheel 37, having half the number of teeth, to produce a movement of the valve 25 at alternate revolutions of the engine or in this instance in the usual four-cycle manner of operating.

The impulse-wheels fit loosely in the chambers 8 and 9, that are inclosed by removable plates 38 and 39, in which latter are formed the bearings 40 and 41 for the shafts 19 and

20, the opposite bearings 42 and 43 being made integral with or attached to the engine-frame 2.

44 is a supply-pipe for gas or fuel, provided with a check-valve 45, which closes automatically when there is pressure in the cylinder 3. A spring 46 is provided to balance the weight of the valve 25 and its connected parts.

47 is an annular water cooling-chamber, 48 an igniting apparatus, and 49 a hand-crank employed in starting the engine.

7 is the exhaust-passage for spent gases.

Having thus explained the nature and objects of my invention, I claim as new and desire to secure by Letters Patent—

1. In explosive-engines, an actuating-cylinder, a piston therein, an exhaust-passage therefrom, increasing in cross-sectional area by progressive stages, a valve governing the exhaust, a series of vane-wheels of different diameters to which said stages of the exhaust-passage are tangential respectively, shafts on which said vane-wheels are mounted, and suitable rod-and-gear connections between said shafts and the piston, substantially as specified.

2. In explosive-engines, a main frame, an open-ended cylinder at one extremity thereof, connected to said main frame by its closed end, an exhaust-passage leading from said closed end, a valve governing the exhaust, shafts mounted in said main frame above said ex-

haust-passage, circular chambers in said main frame concentric with said shafts respectively, opening into said exhaust-passage, vane-wheels in said chambers mounted on said shafts, whose vanes intersect said exhaust-passage, and suitable connections between said respective shafts and the said piston, substantially as specified.

3. In explosive-engines, a main frame, an open-ended cylinder at one extremity thereof, connected to said main frame by its closed end, an exhaust-passage leading from said closed end increasing in cross-sectional area by progressive stages, a valve governing the exhaust, shafts mounted in said main frame above said exhaust-passage, circular chambers of different diameters in said main frame concentric with said respective shafts, opening into said stages of said exhaust-passage respectively, vane-wheels in said chambers mounted on said shafts, whose vanes intersect said exhaust-passage, fly-wheels on said shafts, and suitable connections between said shafts and said piston, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE ALBERT ALDRICH.

Witnesses:

P. W. J. LANDER,
C. C. STEVINSON, Jr.