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H. J. UHLENKOTT.
OSCILLATING ENGINE.
APPLICATION FILED JULY 12, 1904.

3 SHEETS—SHEET 1.

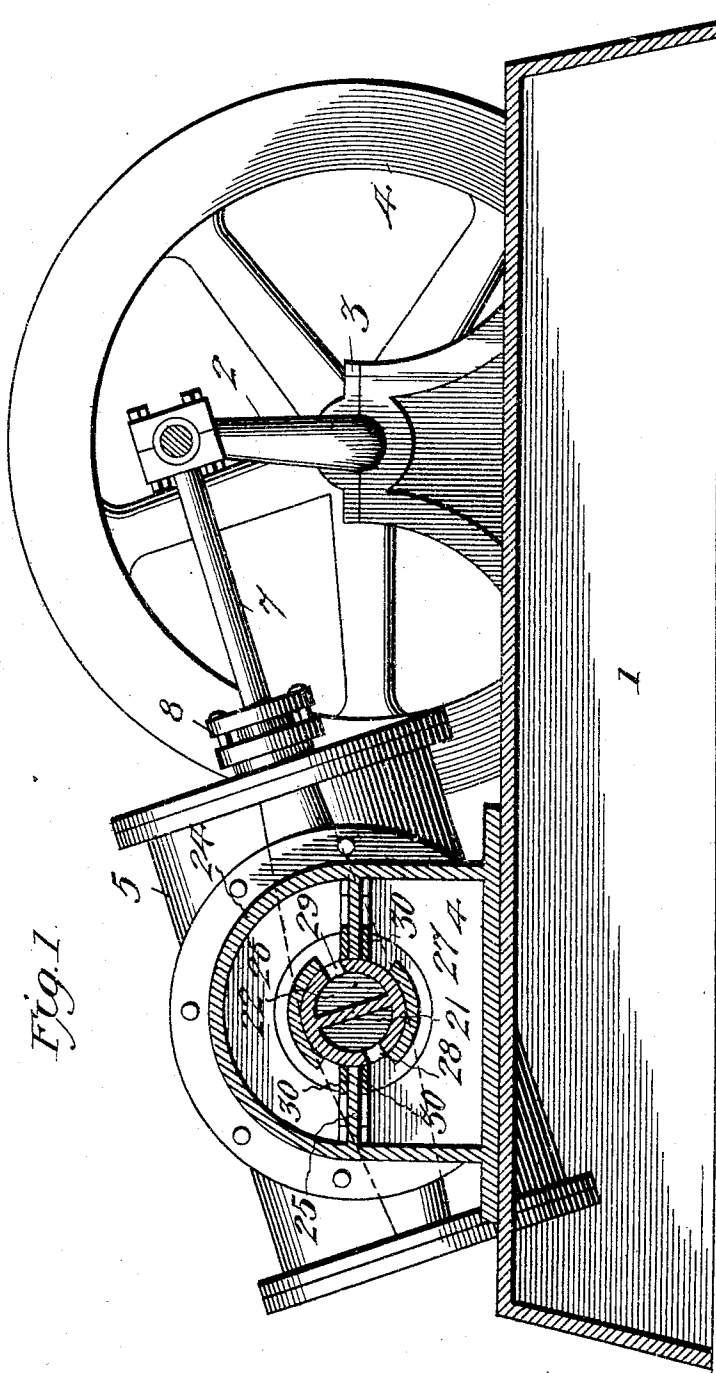


Fig. 1

Witnesses

Geo. Ackman,
Catharine Allen.

Inventor

Herman J. Uhlenkott,

By

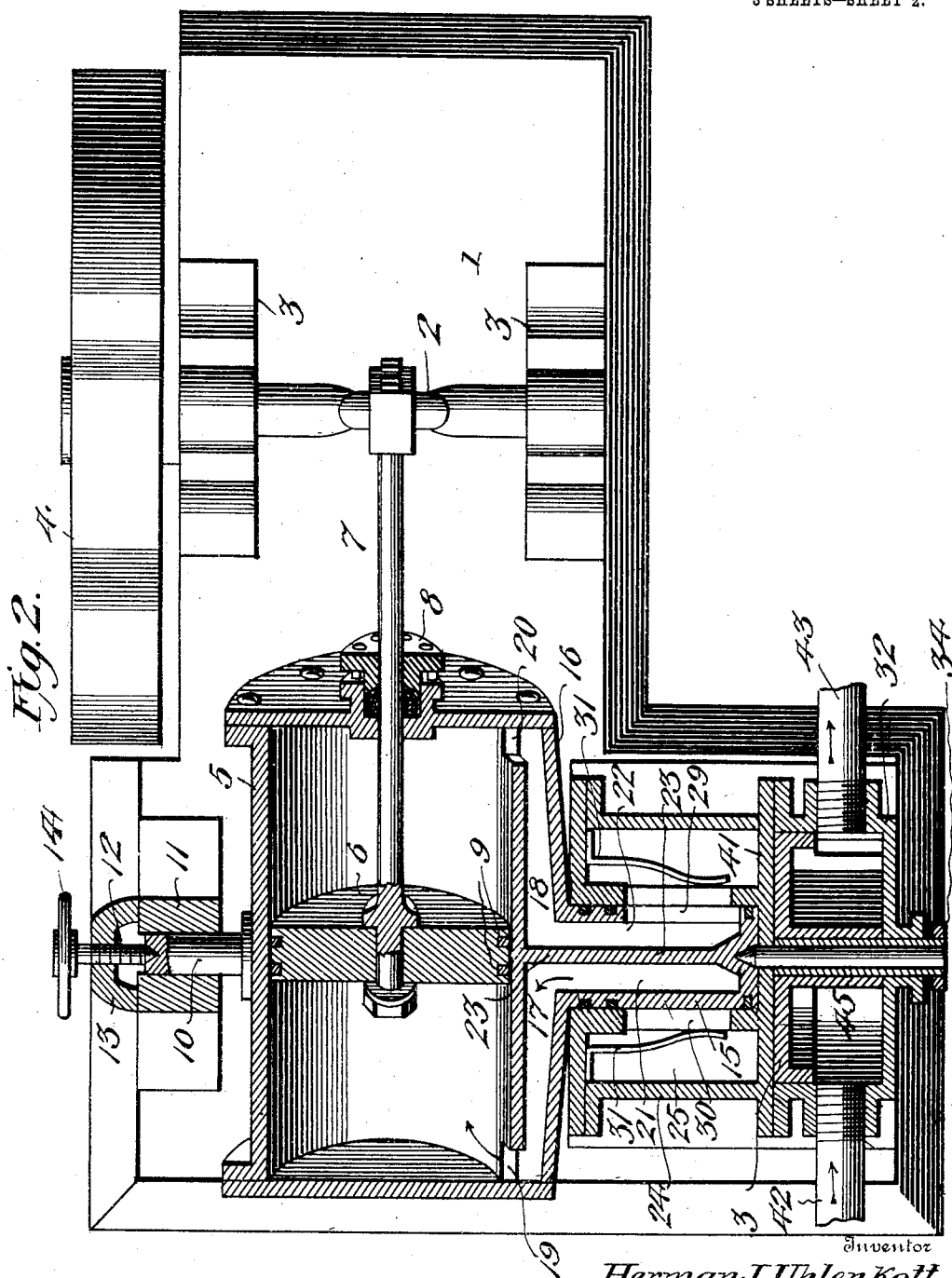
Victor J. Evans
Attorney

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Witnesses

Geo. Ackmanf.
Katharine Allen.

Inventor
Herman J. Uhlenkott,

By Victor J. Evans
Attorney

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3 SHEETS—SHEET 3.

Fig. 4.

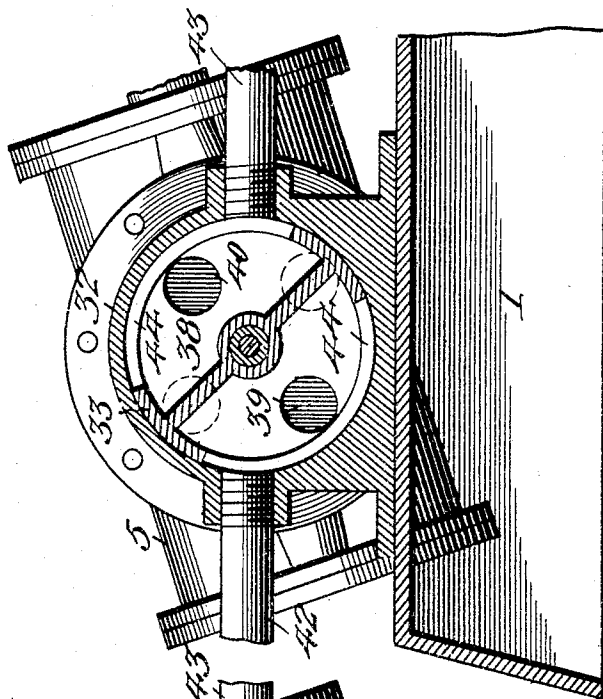
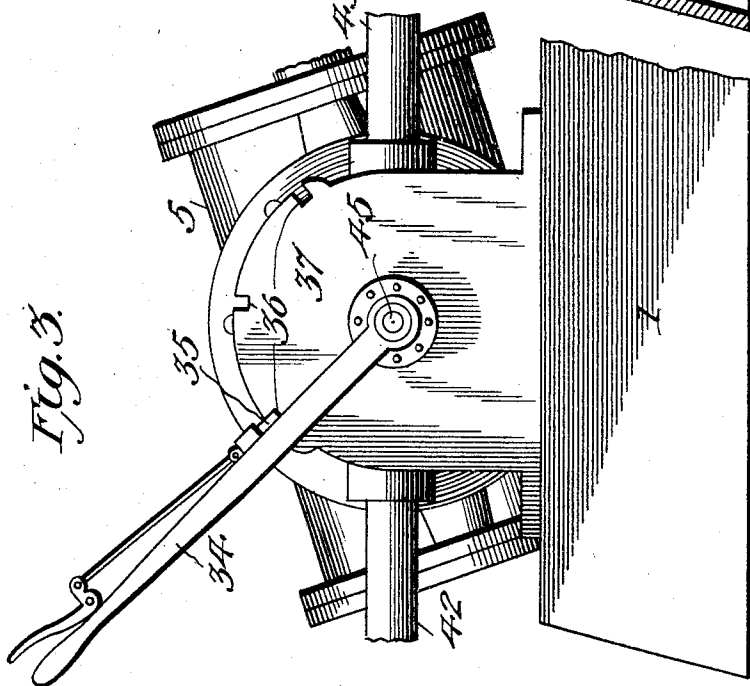


Fig. 3.



Inventor

Herman J. Uhlenkott

By

Victor J. Evans

Attorney

Witnesses

Geo. Ackman

Katharine Allen

UNITED STATES PATENT OFFICE.

HERMAN J. UHLENKOTT, OF KEUTERVILLE, IDAHO.

OSCILLATING ENGINE.

SPECIFICATION forming part of Letters Patent No. 782,801, dated February 14, 1905.

Application filed July 12, 1904. Serial No. 216,238. Continuation of application Serial No. 164,897, filed July 9, 1903.

To all whom it may concern:

Be it known that I, HERMAN J. UHLENKOTT, a citizen of the United States, residing at Keuterville, in the county of Idaho and State of Idaho, have invented new and useful Improvements in Oscillating Engines, of which the following is a specification.

This invention relates to oscillating engines, the object in view being to provide a simple, effective, and cheaply-constructed engine of light-running qualities, one which may be easily handled in starting, stopping, and reversing, and of such construction that there are no delicate parts which render the engine liable to get out of order.

The invention relates particularly to the valve mechanism which controls the admission of steam to and the escape of steam from the cylinder and also what is termed the "adjusting-valve" for starting, stopping, and reversing the engine by varying the positions of the ports through which the live steam is admitted and the exhaust-steam conducted outward.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation of an oscillating engine constructed in accordance with the present invention, the section being taken through the steam-chest to show the valve arrangement. Fig. 2 is a sectional plan view of the engine, taken centrally of the cylinder and valves. Fig. 3 is a side elevation of a portion of the engine, showing the means for operating the adjusting-valves. Fig. 4 is a vertical section taken through the adjusting-valve chamber.

Like reference-numerals designate corresponding parts in all figures of the drawings.

The engine comprises, essentially, a base or bed piece 1, a crank-shaft 2, mounted in bearings 3, a fly-wheel 4, cylinder 5, piston 6, and piston-rod 7, which connects at one end with the crank-shaft 2. The cylinder is provided at one end with a stuffing-box 8, through which the piston-rod 7 passes, and the piston is suit-

ably packed, as shown at 9, the parts thus far described being of any usual or preferred construction and arrangement. In carrying out the present invention the cylinder is provided at one side with a solid trunnion 10, which is received in a bearing 11 and which is provided in its extremity with a central socket to receive the inner end of a threaded bearing-screw 12, which passes through and is adjustable in an upstanding part 13 of the frame, said screw being adjusted by means of a hand-wheel 14 or similar device for properly centering the bearing of the cylinder. At its opposite side the cylinder is provided with a relatively large and hollow trunnion 15, which by the means hereinafter described constitutes the valve for the admission and exit of steam. At the point where the hollow trunnion 15 connects with the cylinder the cylinder is enlarged or made wider, as shown by 16, in order to provide a pair of longitudinal steam-passages 17 and 18, which communicate, by means of ports 19 and 20, with the opposite ends of the cylinder 5. The hollow trunnion 15 is divided into two independent or separate steam-passages 21 and 22 by means of a central longitudinal diametrical partition 23, which extends the full length of the hollow trunnion, as clearly shown in Fig. 2. The hollow trunnion 15 is received and journaled in a steam-chest 24, located at one side of the cylinder, as shown at Fig. 2. The said steam-chest 24 is divided by a central partition or diaphragm 25 into two compartments or chambers, as shown in Fig. 1, thereby forming in a horizontal engine an upper compartment or chamber 26 and a lower compartment or chamber 27. By reference to Fig. 1 it will be seen that the hollow trunnion is provided with diametrically opposite inlet and exhaust ports 28 and 29, respectively, which in the oscillatory movement of the cylinder are adapted to pass and repass the diaphragm or partition 25. It is in this way that the direction of the running of the engine is regulated, the position of the adjusting-valve determining which of the chambers 26 and 27 is admitting and which exhausting steam. For instance, in Fig. 1, 27 is supplying steam and 26 exhausting.

In order to establish a steam-tight joint be-

tween the hollow trunnion or valve 15 and the diaphragm or partition 25, packing-plates 30 and rings are arranged above and below said diaphragm, there being two sets of plates arranged at opposite sides of the hollow trunnion, as clearly shown in Fig. 1. These plates are adapted to slide in a direction substantially radial to the trunnion 15 and are normally urged and held inward in close contact with the trunnion by means of springs 31, located in the steam-chest, suitable provision by means of packing-rings around the trunnion at each end being made that the same may be steam-tight.

15 Located outside of the steam-chest 24 is a reversing-valve chamber 32 of cylindrical shape, in which works a cylindrical valve 33, which is adapted to be turned axially by means of a reversing-valve lever 34, provided with a thumb-latch 35, adapted to engage one of a series of notches or shoulders 36 in a segmental rack or plate 37, as shown in Fig. 3. The valve 33, which is in the form of a hollow cylinder, is provided in its web portion 38 with diametrically opposite steam inlet and outlet ports 39 and 40, while the outer wall 41 of the steam-chest, which also constitutes the inner wall of the reversing-valve chamber, is provided with two sets of diametrically opposite steam-ports, two of which are arranged above the plane of the axis of the reversing-valve and two below, as indicated by the full and dotted lines in Fig. 4. By placing the lever 34 to the left, as shown in Fig. 3, the ports 39 and 40 are brought into communication with two of the ports in the wall 41, leading into the steam-chest, and by swinging said lever to the extreme right the ports 39 and 40 are caused to register with the remaining sets of ports in 41, leading to the steam-chest, thus adapting the engine to be driven in one direction or the other and reversed. By adjusting the lever 34 to an intermediate position the ports 39 and 40 do not register with either set of ports leading to the steam-chest, which results in cutting off the supply of steam and stopping the engine.

42 designates the steam supply or inlet pipe, and 43 the exhaust-pipe, said pipes communicating with the reversing-valve chamber at diametrically opposite points. The outer wall or periphery of the valve 33 is provided with openings or slots 44 of sufficient length to admit and exhaust the steam under any adjustment of the lever 34.

The hollow trunnion 15 is supported by and oscillates upon a threaded pin or other suitable arrangement 45, upon which revolves a sleeve upon which valve 33 is mounted, lever 34 being fastened to said sleeve.

In operation the steam is admitted through the pipe 42 into the valve-chamber 32, whence

it passes through the port 39 and one of the ports in 41 into the steam-chest 24, thence through the port 28, for instance, in the hollow trunnion, along the passages 21 and 17, and through port 19 into one end of the cylinder. At the same time the exhaust-steam from the opposite end of the cylinder passes through the port 20, passages 18 and 22, outward through the port 29 of the hollow trunnion or valve into the upper chamber 26 of the steam-chest, thence through one of the ports in 41 and port 40 in the reversing-valve into the valve-chamber 32, and thence outward through the exhaust-pipe 43. It will of course be understood that as the cylinder oscillates the combined hollow trunnion or valve 15 is rocked in its bearings, so that the steam passing into the steam-chest enters alternately the ports 28 and 29 in said trunnion and alternately exhausts through the other port. It will also be understood that by means of the reversing-valve the steam admitted through the pipe 42 may be directed into either the lower compartment or chamber 27 or into the upper compartment or chamber 26 of the steam-chest, according to the direction in which the engine is to be driven. By adjusting the lever 34 to its middle position the steam is cut off and the engine stopped.

Having thus described the invention, what is claimed is—

1. An engine comprising an oscillatory cylinder, trunnions therefor, one of which is hollow and partitioned off to provide separate steam-passages, a steam-chest in which the hollow trunnion works, a diaphragm dividing the steam-chest into independent chambers which alternately communicate with the passages of the trunnion through ports in the latter, and spring-pressed packings on opposite sides of the diaphragm bearing against the hollow trunnions.

2. An engine comprising an oscillatory cylinder, trunnions therefor, one of which is hollow and partitioned off to provide separate steam-passages, a steam-chest in which said trunnion works, a diaphragm dividing the steam-chest into independent chambers which alternately communicate with the passages of the hollow trunnion through ports in the latter, the chest-head having two admission-ports at each side of the diaphragm, and a reversing-valve with one inlet and one outlet port adapted to register with either set of ports leading into the steam-chest.

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

HERMAN J. UHLENKOTT.

Witnesses:

J. M. WOLBERT,
POWELL GIBSON.