

L. A. HUGGINS.
MULTICYLINDER OSCILLATING STEAM ENGINE.
APPLICATION FILED DEC. 13, 1909.

992,424.

Patented May 16, 1911.

4 SHEETS—SHEET 1.

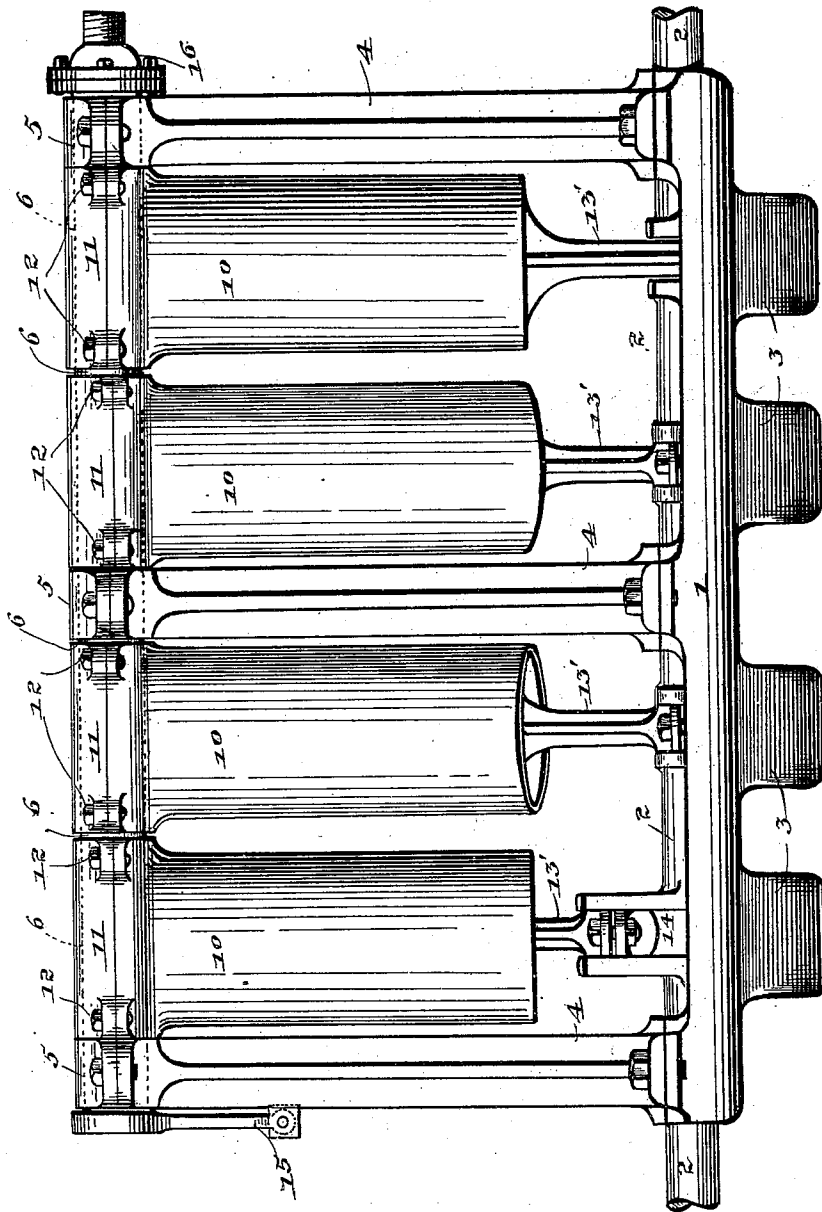


Fig. 1.

Witnesses

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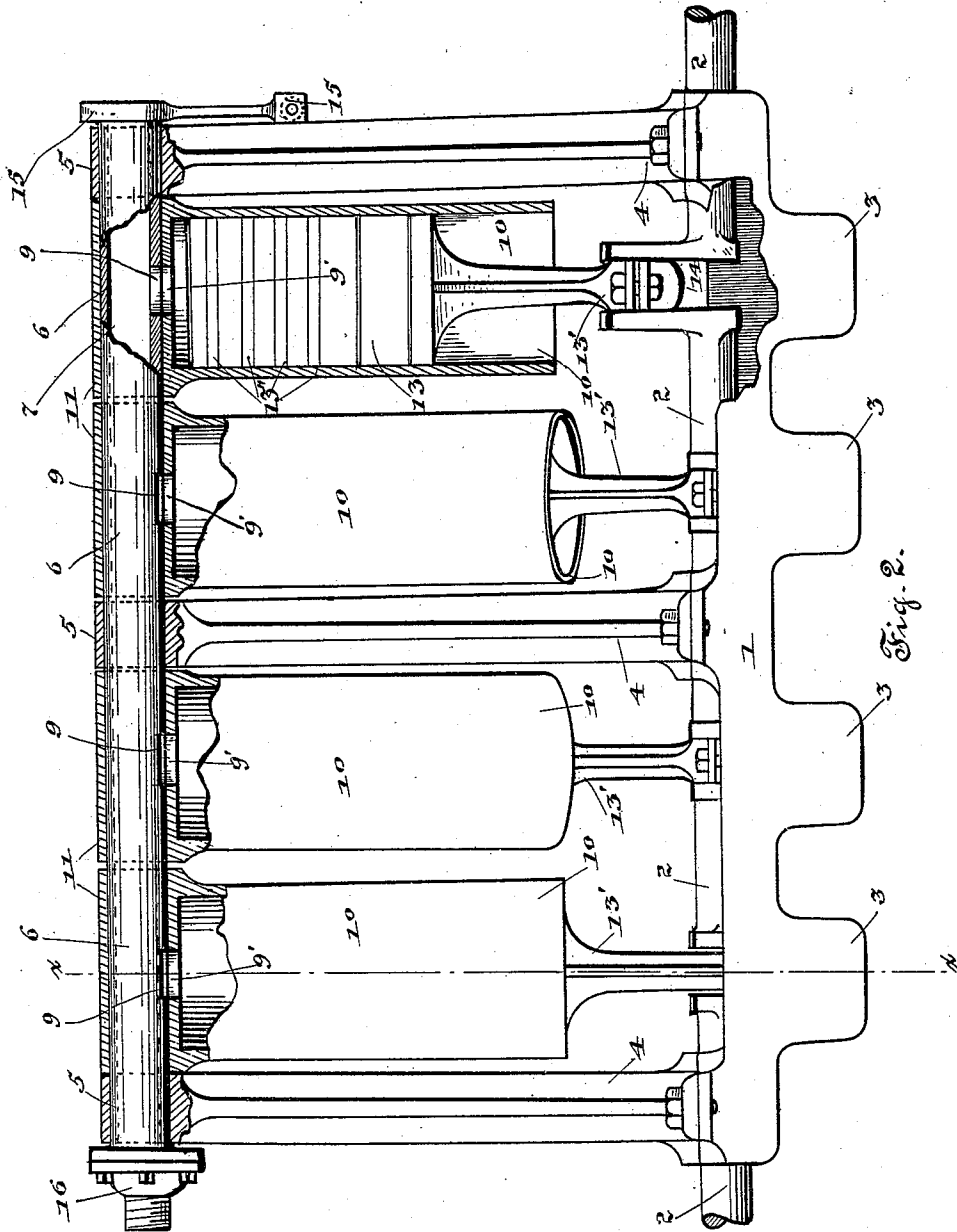
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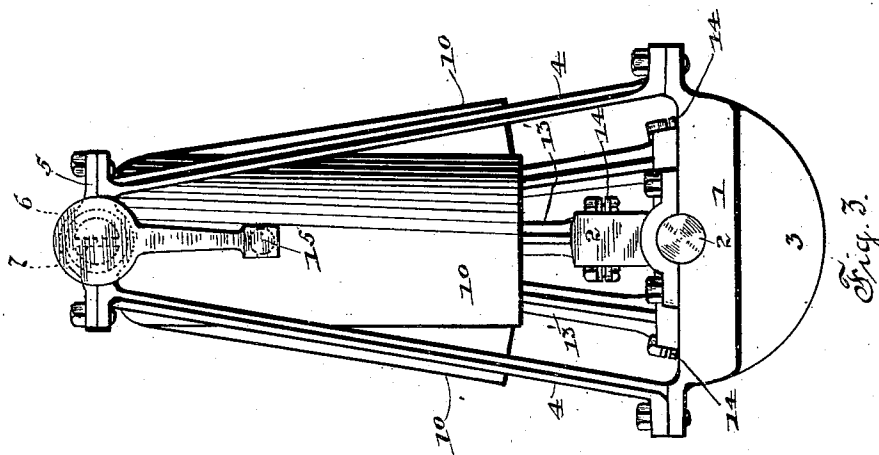
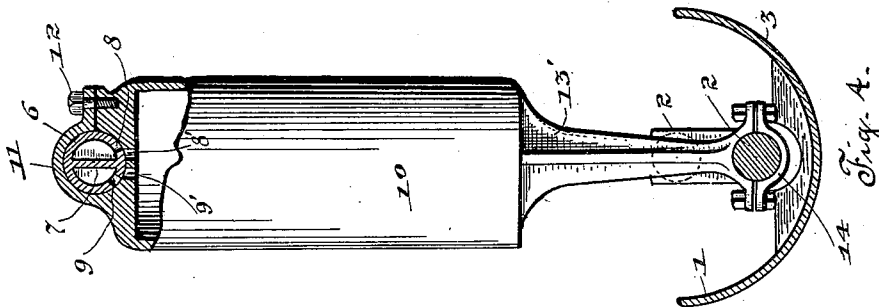
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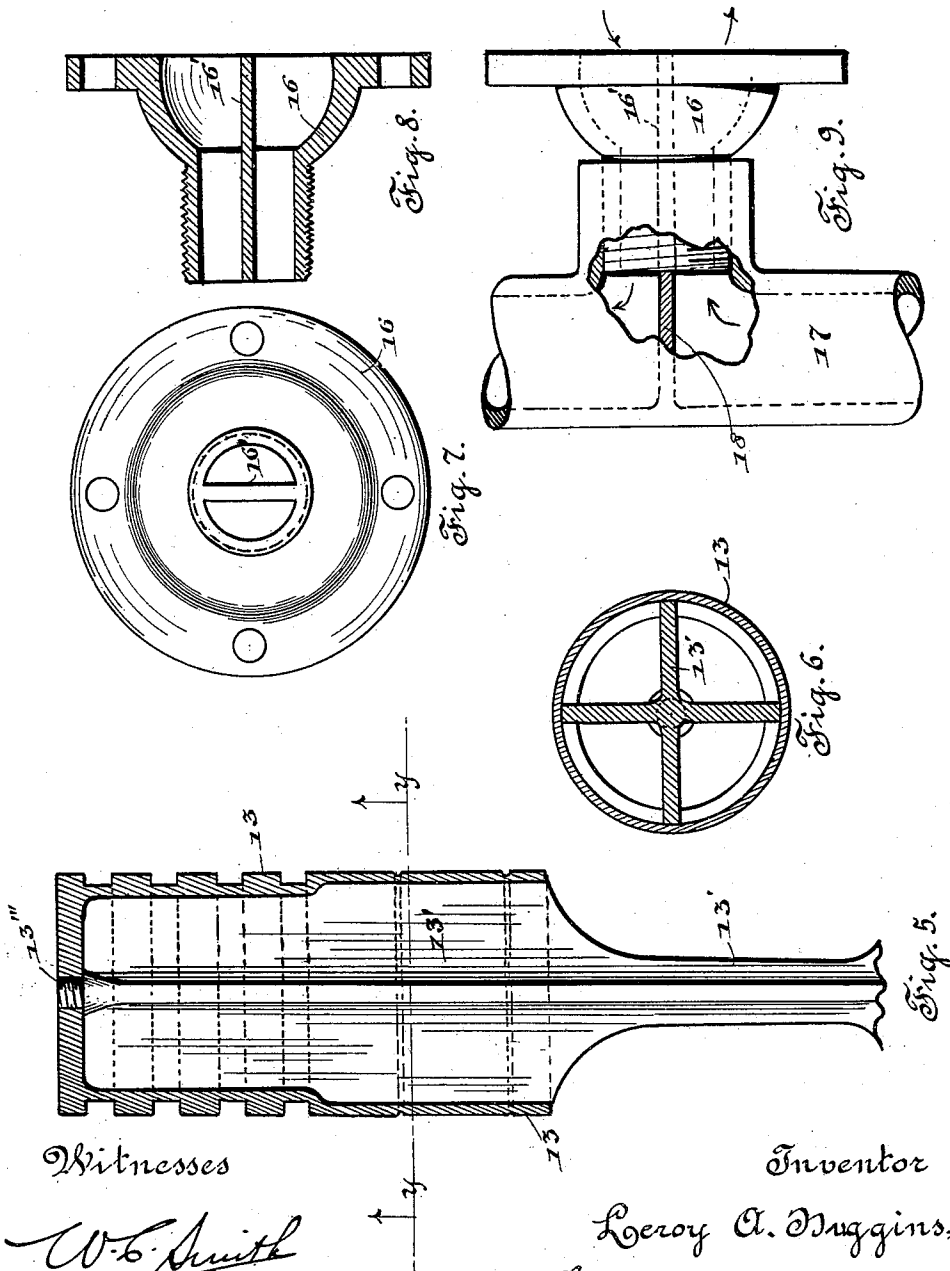
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4 SHEETS—SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

LEROY A. HUGGINS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO EDGAR GALEZIO, OF CHICAGO, ILLINOIS.

MULTICYLINDER OSCILLATING STEAM-ENGINE.

992,424.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed December 13, 1909. Serial No. 532,944.

To all whom it may concern:

Be it known that I, LEROY A. HUGGINS, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Multicylinder Oscillating Steam-Engines, of which the following is a specification.

My invention relates to improvements in multi-cylinder single-acting steam engines of the oscillating type and has for its object the production of an engine of this character which shall be inexpensive of construction and efficient in operation.

A further object of my invention is to provide a simple and effective steam chest and port arrangement and means for cutting off the steam to all the cylinders simultaneously.

Other objects will appear hereinafter.

With these objects in view my invention consists in the novel construction and arrangement of parts all as will be hereinafter fully described and particularly pointed out in the appended claim.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a side elevation of my improved oscillating engine, Fig. 2 is a partial vertical longitudinal section thereof, Fig. 3 is an end elevation, Fig. 4 is a partial vertical section taken on line *x-x* of Fig. 2, Fig. 5 is a detail section showing the construction of a cylinder piston, Fig. 6 is a transverse section taken on line *y-y* of Fig. 5, Fig. 7 is a detail end elevation showing a coupling attached to the end of the engine for properly directing the flow of the supply and exhaust steam, Fig. 8 is a horizontal section of said coupling, and Fig. 9 is a detail side elevation showing said coupling in connection with a T-pipe having intake and exhaust passages leading to and from the engine respectively.

Referring now to the drawings 1 designates the engine bed member or crank case and 2 a crank shaft journaled therein, the latter being provided with a plurality of cranks, as shown in Figs. 1 and 2. The crank case 1 is provided with a series of pockets 3 to make clearance for the cranks of the crank shaft 2, and in said pockets a suitable lubricator is provided in order that the crank pin bearings may be lubricated by splash.

Secured to the crank case 1 and converg-

ing therefrom are standards 4 the upper ends of which are formed into bearings which are provided with suitable caps 5, and in these bearings a tubular steam chest 6 is journaled. The steam chest 6 extends longitudinally and normally is stationary in its bearings but may be partially rotated in the latter by means to be hereinafter described. The steam chest 6 is divided into two longitudinal passages which are separated by a diametrical partition 7 which has a substantially vertical disposition in said steam chest. Through one of the passages in the steam chest 6 the supply steam to the engine is adapted to flow and through the other the exhaust steam. Formed in the lower side of the steam chest 6 and leading from the intake passages therein are a series of admission ports 8 which are adapted to register with intake ports 8' formed in the cylinder heads, and leading into the exhaust passages of the steam chest 6 are a series of exhaust ports 9 which are adapted to register with ports 9' formed in the cylinder heads.

Each cylinder 10 is suspended from the steam chest 6 and is adapted to oscillate thereon, as shown in detail in Fig. 4, a member 11 in each cylinder head embracing the steam chest 6 which has its end secured by means of the screw 12. The elongated pistons 13 are adapted to operate in the cylinders 10 in the usual manner, and the piston rods 13' are nicely fitted in said pistons and secured therein by means of the threaded end 13''. Ordinary packing rings 13'' are provided, as shown in Fig. 2. The construction of the piston rods 13' is such that they are peculiarly light and strong, the same being cross-shaped in cross section, this feature being conducive to a light-running and vibrationless engine. Bearing caps 14 which embrace the crank pins of the crank shaft 2 are secured to the connecting rods 13' by means of cap-screws, as shown.

As aforesaid, the steam chest 6 is normally stationary and the ports therein register with the ports in the cylinder heads in such a manner that the cylinders will receive a maximum amount of steam, but if it is desired to cut off the steam the steam chest 6 is partially rotated by means of the downwardly extending arm 15 provided at one extremity thereof. In this manner the flow of steam to the engine is controlled.

A coupling 16 is secured to one end of the

steam chest 6 by means of cap-screws, as shown in Fig. 2, and in this coupling a diametrical longitudinally extending partition 16' is provided which registers with the diametrical partition of the steam chest, the passages on either side of said partition forming extensions of the passages in the steam chest. Connected to the coupling 16 is a T-pipe 17 having exhaust and intake passages and provided with a transverse partition 18 which is adapted to register with the partition 16' when this pipe is properly secured to the coupling 16.

It will be noted that the crank pins of the crank shaft 2 are arranged on the quarter and that because of this construction the moving parts are perfectly balanced and a more uniform torque is produced than would be the case were said pins positioned in the same plane.

While I have shown what I deem to be the preferable form of my invention I do not wish to be limited thereto as there might be various changes made in the details of construction and arrangement of parts described without departing from my invention, and hence I desire to avail myself of such changes and alterations as fairly fall within the spirit and scope of the appended claim.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

A steam engine comprising a crank case, a crank shaft rotatably mounted in said case, upwardly extending standards secured to

said case, a normally stationary adjustable tubular steam chest mounted in said standards at the upper ends thereof, a diametrical vertical partition in said steam chest separating the same into admission and exhaust passages, said steam chest being provided with admission and exhaust ports, a plurality of cylinders open at one end and closed at the other, the closed ends or heads of said cylinders being provided with adjustable transverse bearings fitting snugly on said steam chest whereby said cylinders have an oscillatory movement and said heads being provided with intake and exhaust ports adapted to register respectively with ports in said steam chest, elongated pistons in said cylinders, piston rods connecting said pistons and said crank shaft, said pistons being hollow and said rods being provided with ends fitting snugly therein and of cruciform cross-section, an arm fixed to one end of said steam chest for angularly adjusting the same to control the admission of steam to said cylinder, and a flexible pipe coupling secured to the other end of said steam chest and having a diametrical partition therein registering with the diametrical partition of said steam chest, substantially as described.

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

LEROY A. HUGGINS.

Witnesses:

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