

No. 748,559.

PATENTED DEC. 29, 1903.

A. J. PEET.
COMPOUND ENGINE.

APPLICATION FILED APR. 13, 1901.

NO MODEL.

4 SHEETS—SHEET 1.

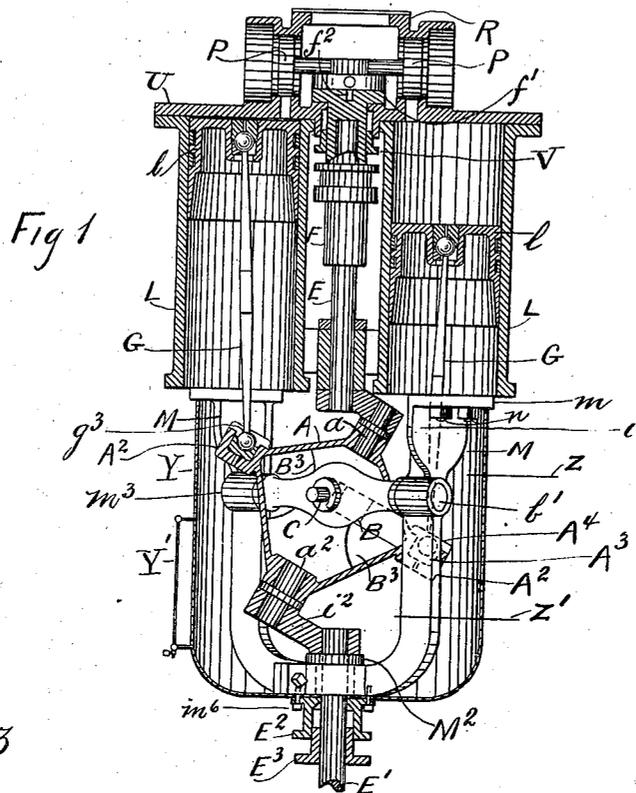
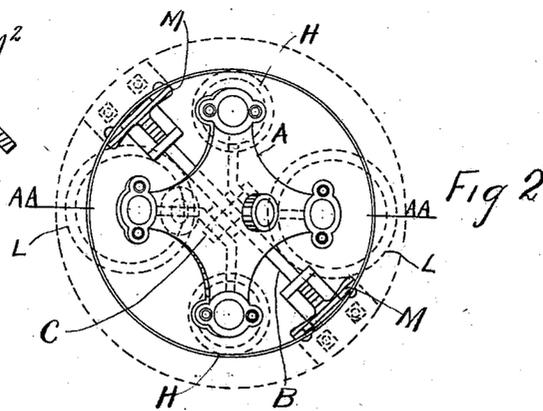
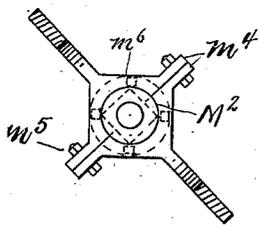


Fig 3



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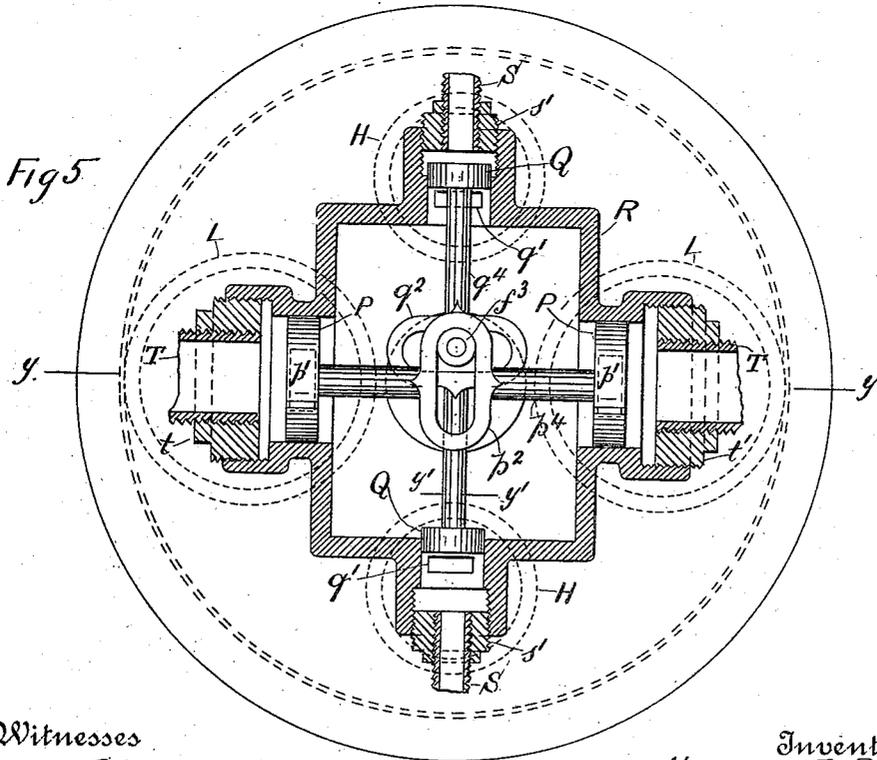
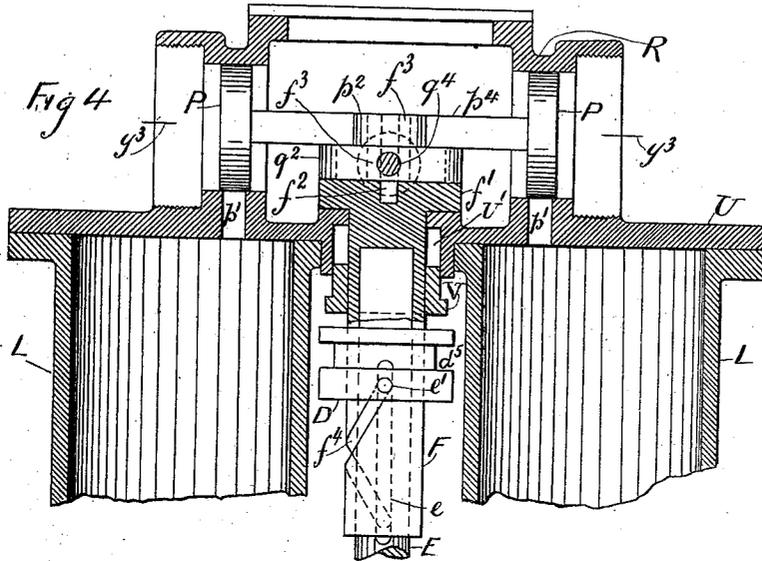
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig 6

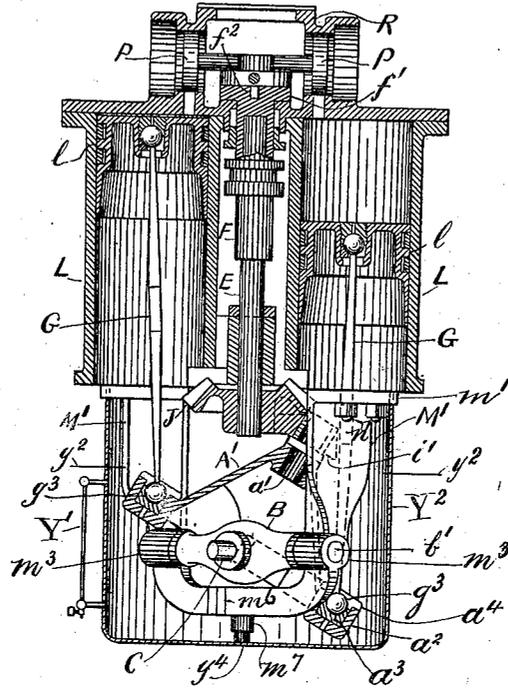
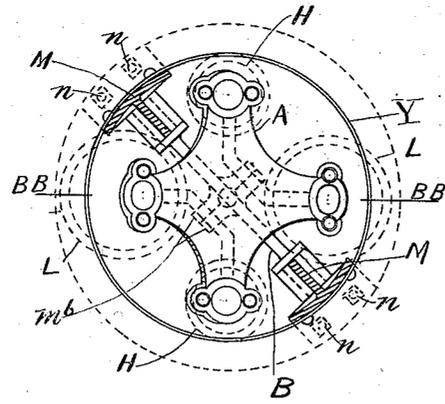


Fig 7



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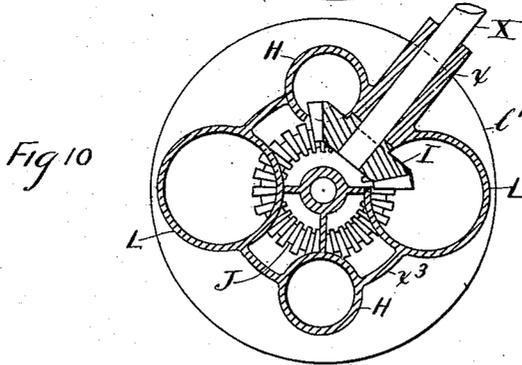
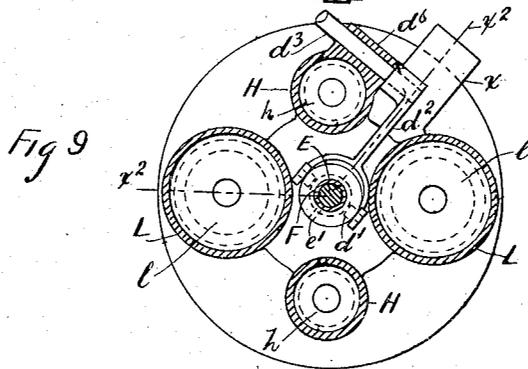
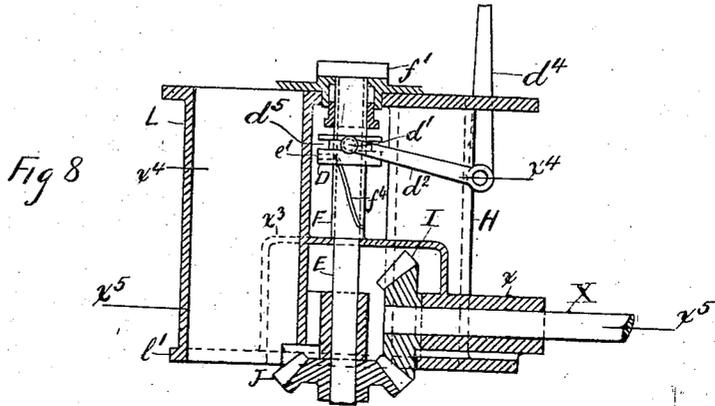
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APPLICATION FILED APR. 13, 1901.

NO MODEL.

4 SHEETS—SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER J. PEET, OF BROOKLYN, NEW YORK.

COMPOUND ENGINE.

SPECIFICATION forming part of Letters Patent No. 748,559, dated December 29, 1903.

Application filed April 13, 1901. Serial No. 55,669. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER J. PEET, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Compound Engines, of which the following is a specification.

This invention relates to engines in which the mechanism is balanced to obviate the necessity of fly-wheels. Its object is the production of multiple-cylinder engines of compact form, light weight, and simple construction.

Figure 1 represents a fragmentary vertical section of the engine on the line A A and A A of Fig. 2. Fig. 2 shows a fragmentary horizontal section on the line Z of Fig. 1. Fig. 3 is a fragmentary section on the line Z' of Fig. 1. Fig. 4 is an enlarged sectional view of the upper portion of the engine on lines $y y$ and $y' y'$ of Fig. 5. Fig. 5 represents a fragmentary section on the line $y^3 y^3$ of Fig. 4. Fig. 6 shows a fragmentary section of a modification of my invention on the line B B and B B of Fig. 7. Fig. 7 is a section on the line $y^2 y^2$ of Fig. 6. Fig. 8 shows a fragmentary section of the engine on the line $x^2 x^2$ of Fig. 9. Fig. 9 is a partial section on the line $x^4 x^4$ of Fig. 8. Fig. 10 shows a partial section on the line $x^5 x^5$ of Fig. 8.

The engine constituting the subject-matter of this invention is an improvement of the engine described and claimed in my United States Letters Patent for compound engine, No. 671,386, dated April 2, 1901, and the principal improvements in the present invention are contained in the valve-gear and connections between the said valve-gear, main shaft, and connecting-rods.

The engine can be constructed with various combinations of cylinders, and in this instance is shown to consist of the two high-pressure cylinders H and the two low-pressure cylinders L, containing, respectively, the similar pistons h and l . Connecting-rods G transmit motion from the pistons to a double-cone-shaped lever A, whose apexes are connected to the cranks i and i^2 , extending, respectively, from the shafts E and E'. The cylinders are capped by a steam-reservoir R, and the brackets M are secured to the cylinders

at their lower ends by bolts n through the flanges m , the said brackets being bolted together through their lower flanges m^4 by bolts m^5 , where a bushing M² is held in place. To the brackets M is fastened the casing Y, which is pierced through its lower side by the shaft E', and a stuffing-box E², with gland E³, is fastened to the casing and lower portion of the said brackets by screws m^6 . A supporting-beam B, with trunnions b' , swings in the bearings m^3 of the brackets M.

The double-cone-shaped lever A swings on the pin C, carried on the supporting-beam B, the said lever A being provided with openings B³ to accommodate the beam B, securing, by virtue of the combined oscillations of the supporting-beam B on its trunnions b' and the lever A on the pin C, the motions of a universal joint for the said double-cone-shaped lever A. At the upper apex of A is secured a pin a , which turns the crank i , extending from the shaft E, and at the lower apex the pin a^2 turns the crank i^2 . In the periphery of the lever A are attached boxes A², with brasses A³ and caps A⁴ for the lower ends g^3 of the connecting-rods G.

On the shaft E, (see Figs. 4 and 5,) which drives the valve-gear, there is fitted a capped sleeve F, turning in a stuffing-box with a gland V in the cylinder-head U, and to the cap f' of the sleeve is fastened the pin f^2 , carrying the rollers f^3 . Yokes $p^2 q^2$, placed at right angles to each other and one over the other, straddle the rollers f^3 , and the valve-rods $p^4 q^4$, extending, respectively, from the yokes, carry the valves P and Q, which latter move over the ports p' and q' . The shaft E is slotted with a straight groove e , while the sleeve F contains a helical groove f^4 across its surface, and the collar D, sliding over the sleeve F, carries a pin e' , which fits both the said vertical and helical grooves, causing the sleeve to turn relatively to the shaft when the collar is moved in the axial direction of the said shaft E.

Referring to Figs. 6 to 10, I show a modification of my invention wherein a pyramidally-shaped lever A' is supported similarly to the lever A of Fig. 1 on the supporting-beam B and pin C. At the apex of A' is secured a pin a' , which turns the crank i' , extending from the bevel-wheel J, which wheel meshes

with bevel-wheel I, to which is fastened the main shaft X. In the lower periphery of A' are contained the boxes a^2 , with brasses a^3 and caps a^4 for the lower ends g^3 of the connecting-rods G. Brackets M' are bolted through their flanges m' , by means of bolts n' , to the lower ends of the cylinders, the said brackets being bolted together through their lower flanges m^6 , where a nipple m^7 is held in place, which incases a pin y^4 , secured to the casing Y². A gage-glass Y' is fitted to the casing Y².

In both forms of my invention a bearing d^6 (see Fig. 9) is cast or secured to one of the cylinders, and in the said bearing oscillates a spindle d^3 , which carries a forked lever d^2 , supporting rollers d' , which actuate in the groove d^5 of the collar D when it is moved up and down the sleeve F by means of a handle-bar d^4 , secured to the spindle d^3 . It is evident that the position of the pin e' controls the relative positions of the sleeve F to the shaft E, and there is obtained a simple device for reversing the engine.

In the modification of my invention a hollow chamber x^3 (see Figs. 8 to 10) is cast with the cylinders to cover the gears J and I and to prevent the oil splashing above said gears from the casing covering the lower end of the engine.

Steam enters the high-pressure cylinders (see Figs. 4 and 5) through the pipes S S after passing the valves Q Q by means of the ports $q' q'$, and upon the upstrokes of said pistons the steam enters the receiver R and from thence is led into the low-pressure cylinders through the ports $p' p'$ by means of the valves P P and returning through said ports under control of the valves P P exhausts through the pipes T T.

Referring to Figs. 1 and 2, it will be evident that when the double-cone-shaped lever A is in the position shown in the drawings and a push is exerted on the box A² by a connecting-rod of a high-pressure piston the pin a will turn the crank i , with the shaft E, and the pin a^2 , with crank i^2 , will turn the shaft E', and after having revolved ninety degrees one of the low-pressure connecting-

rods will come in play, and thus continued by the other high and low pressure piston-rods in like manner will produce a uniform and easy motion.

In the modified form of my invention (see Figs. 6 and 8) the pin a' through the crank i' turns the shaft E, which carries the bevel-wheel J, and consequently communicates motion to the main shaft X through the bevel-wheel I.

Having described my invention, I desire to secure by United States Letters Patent and claim—

An engine comprising, cylinders H and L, pistons h, l actuating in the cylinders, a lever A swinging on a universal joint, connecting-rods G connecting the pistons and the lever, valves P, Q, operating over ports p', q' on the cylinder-head U, valve-rods q^4, p^4 , yokes q^2, p^2 , formed in the valve-rods, a valve-shaft E supported over and connected with the lever A, a pin a connected to said lever, a crank i secured to the valve-shaft E and engaged with the pin a , a main shaft E' below the lever A, a crank i^2 secured to the shaft E', a pin a^2 connected to crank i^2 and engaged with the lever A, a capped sleeve F over valve-shaft E, a pin f^2 in the cap f' of the said sleeve, rollers f^3 turning on the pin f^2 communicating motion to the valve-yokes, a collar D with the pin e' actuating in a straight slot in the shaft E and in a helical slot in the sleeve F, a forked lever d^2 , rollers d' on the forked lever engaging in the circular groove d^5 in the collar D, a handle-bar d^4 secured to the spindle d^3 supporting the forked lever d^2 , brackets M extending from the cylinders H, L, a casing Y surrounding the brackets and pierced for the shaft E', a stuffing-box E² with gland E³ secured to the brackets M, substantially as described.

Signed at New York, in the county of New York and State of New York, this 11th day of April, A. D. 1901.-

ALEXANDER J. PEET.

Witnesses:

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WM. P. FRANC.