J. H. CARROLL.

ROTARY ENGINE.

APPLICATION FILED SEPT. 7, 1909.

993,960. Patented May 30, 1911.

Fig. 1

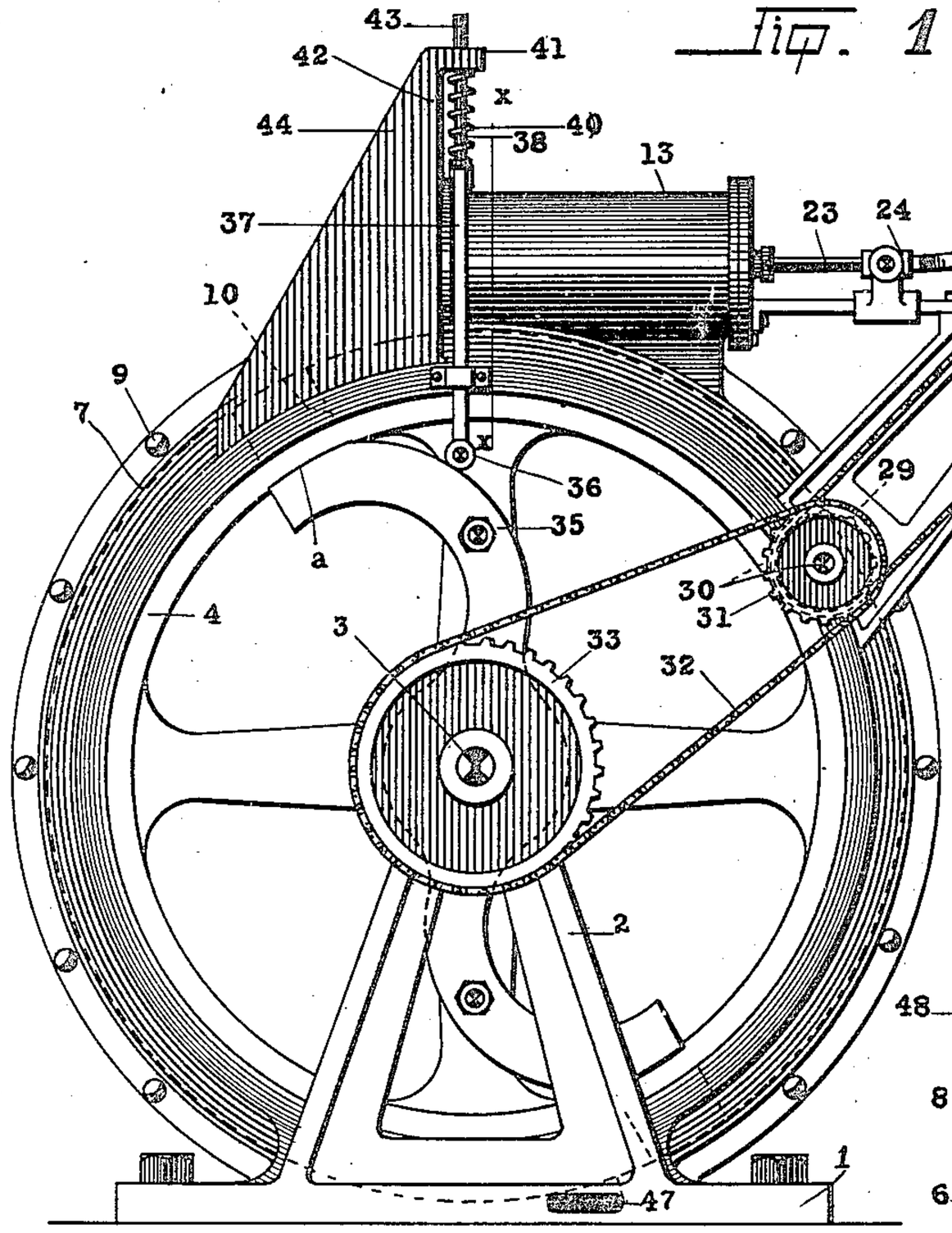


Fig. 2

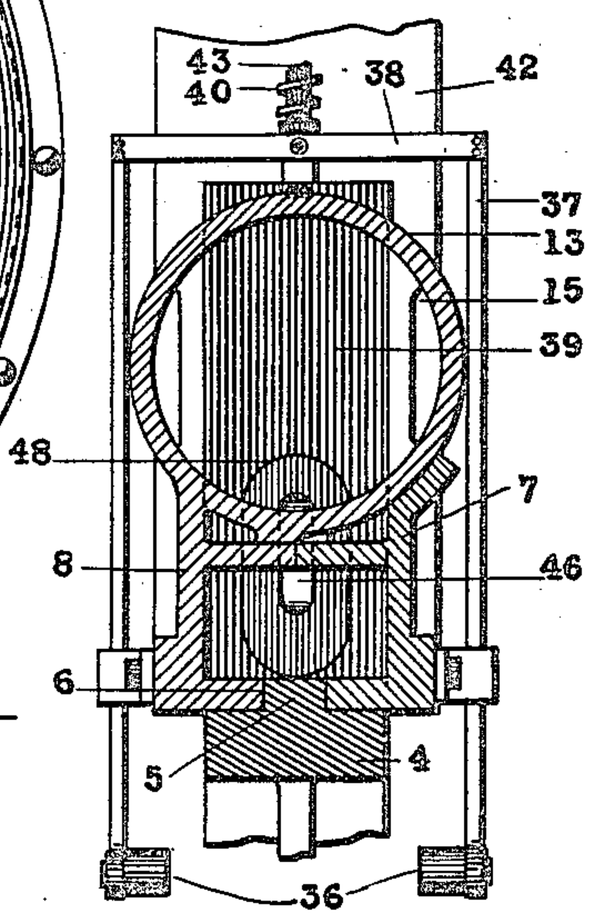


Fig. 4

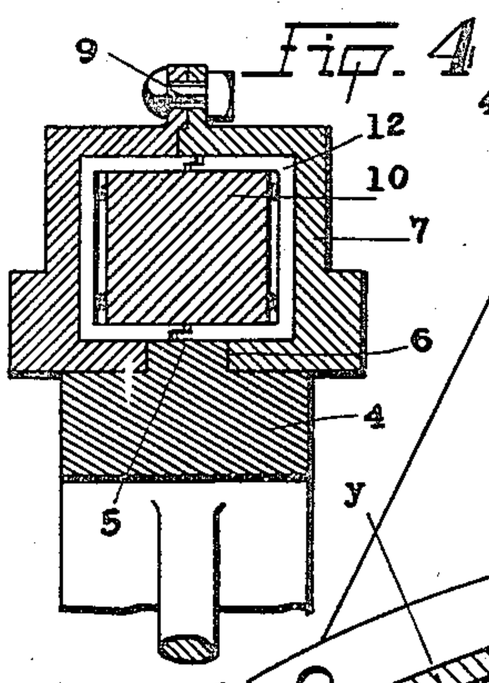
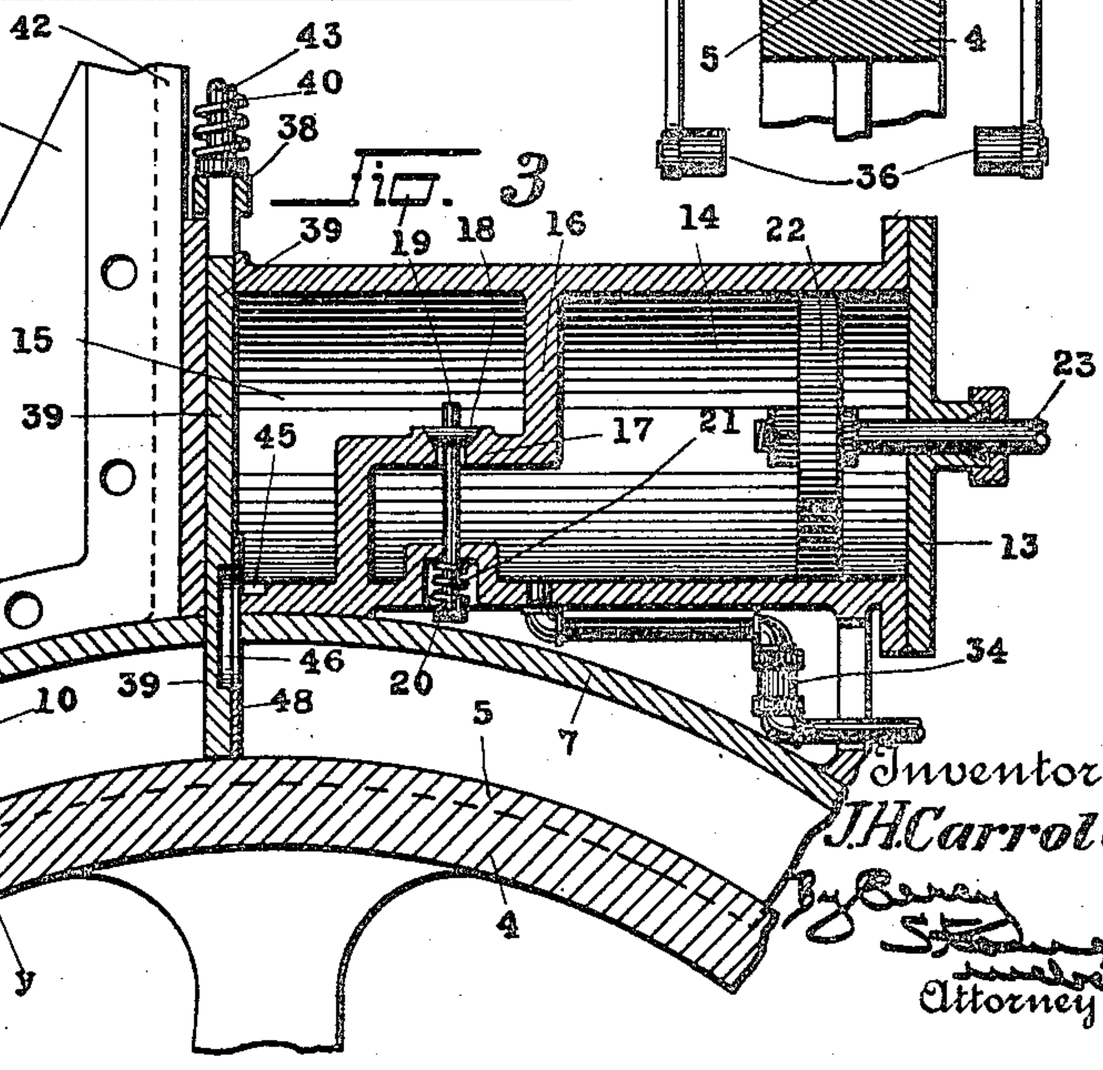


Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH H. CARROLL, OF STOCKTON, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JAMES H. CARLTON, OF STOCKTON, CALIFORNIA.

ROTARY ENGINE.

993,960. Specification of Letters Patent. Patented May 30, 1911.

Application filed September 7, 1909. Serial No. 516,445.

To all whom it may concern:

Be it known that I, JOSEPH H. CARROLL, a citizen of the United States, residing at Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Rotary Engines; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in explosive engines and particularly to that type known as rotary engine, the object of the invention being to produce a rotary gas engine which will have an effectual explosive resistance wall spaced from the driving piston whereby such driving piston will receive the full force and effect of the explosion.

A further object of the invention is to produce a rotary engine which will have a plurality of explosions to each revolution.

A further object of the invention is to produce a simple and inexpensive engine and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claim.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of the complete engine. Fig. 2 is a sectional view taken on a line *x*—*x* of Fig. 1. Fig. 3 is a sectional view showing the compression and explosion chambers and a portion of the drive chamber. Fig. 4 is a sectional view taken relatively on a line *y*—*y* of Fig. 3.

Referring now more particularly to the characters of reference on the drawings 1 designates the base frame of the engine, the same having projecting journal frames 2 in which is journaled the main drive shaft 3. On said shaft 3 is mounted the drive wheel 4 having a flange 5 projecting from its outer rim into a groove 6 in a drive cylinder casing, formed of two members 7 and 8 suitably flanged and bolted together as at 9. Within said drive cylinder are two piston heads 10 secured to the wheel 4 by means of a dovetail 11 or other suitable means, such piston heads having packing rings 12.

13 is a cylinder divided into a compression chamber 14 and an explosion chamber 15, such division being accomplished by an angular division wall 16 providing a horizontal shelf 17 in which is a valve 18 having a rod 19 projecting outside the cylinder 13 and having a collar 20, there being a spring 21 interposed between said collar and said cylinder 13.

In the chamber 14 is a piston 22 having a rod 23 connected with a guide 24 connected by a counter shaft 25 with a crank 26 driven by a gear 27 mounted on a shaft 27ª connected by a chain 28 with a gear 29 mounted on a shaft 30 journaled on the casing 7 there being another gear 31 on said shaft 30 connected by a chain 32 with a gear 33 on the shaft 3 all the gears 27, 29 and 31 being equal and the gear 33 being of a ratio of two to one with respect to said gears whereby with every revolution of the wheel 4 the piston 22 will make two strokes and thus making a double compression in said chamber 14. With the backward stroke of the piston 22 it closes the valve 18 and intakes the explosive mixture through a check valve controlled intake pipe 34. Then with the forward drive of said piston 23 it compresses said mixture and opens the valve 18 and forces said compressed mixture into the explosion chamber 13 and just at this time the revolution of the wheel 4 brings cams 35 on said wheel into contact with rollers 36 and arms 37 of a cross head 38 carrying a sliding plate valve 39 over the end of the explosion-chamber 15 and completely closing said chamber while one of the piston heads 10 passes the line of said valve 39, this being occasioned by a portion "*a*" of the cams 35 following the contour of the cylinder 7—8 for the length of said piston head 10 and when said piston head 10 has just passed the line of the valve 39 the cam 35 abruptly terminates and the rollers 36 drop off permitting a spring 40 interposed between the cross head 38 and a guide lug 41 on the valve back or seat 42 and surrounding a rod 43 movable through said lug 41, to return said valve 39 to normal position across the cylinder 7—8 (see Figs. 2 and 3), thus

closing said cylinder to the rear of the head 10 which has just passed and communicating with a port 45 in the chamber 15 with a port 46 in the valve 39 thus opening the chamber 15 into the cylinder 7—8 and then the explosion takes place in the chamber 15 and passes into the cylinder 7—8, the valve 39 giving the necessary resistance between it and the head 10 and thus the explosion drives the head 10 and incidentally the drive wheel 4 around the cylinder 7—8, the exhaust taking place near the bottom of said cylinder as at 47, the above operation taking place continually for each of the piston heads 10 since, as described, there are two compressions and explosions for each revolution of the wheel 4.

The valve port 46 may have a suitable packing ring 48 and likewise all the other ports and parts may be suitably packed to prevent leakage but this of course would be of the ordinary type of packing, hence, I make no mention of the same at this time. The valve back or seat 42 has suitable strengthening ribs 44 so that the force of the explosion in the chamber 15 will not loosen or weaken the valve.

From the foregoing description it will be readily seen that I have produced a rotary gas engine which substantially fulfils the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention.

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

A rotary explosive engine comprising an explosive cylinder and an annular working chamber, a valve movable transversely through said explosion cylinder and annular working chamber and having a port to open communication between said explosion cylinder and said working chamber, arms on said valve, a revolving wheel, cams on said wheel engaging said arms, said cams having a portion following the contour of said wheel, as described.

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

JOSEPH H. CARROLL.

Witnesses:
JOSHUA B. WEBSTER,
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