J. ZEITLIN.

VALVE AND VALVE GEAR FOR INTERNAL COMBUSTION AND OTHER ENGINES.

APPLICATION FILED JAN. 10, 1917.

1,292,215. Patented Jan. 21, 1919.

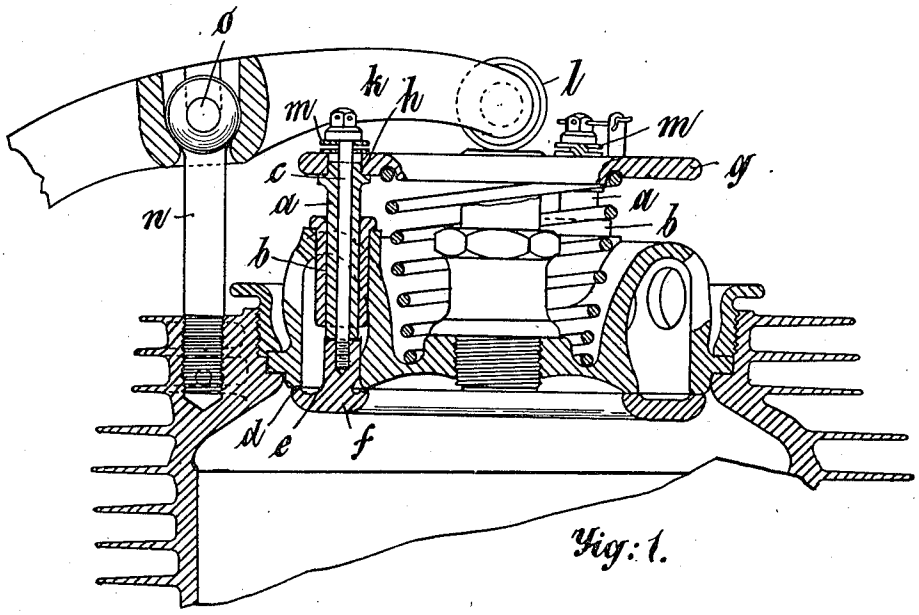


Fig: 1.

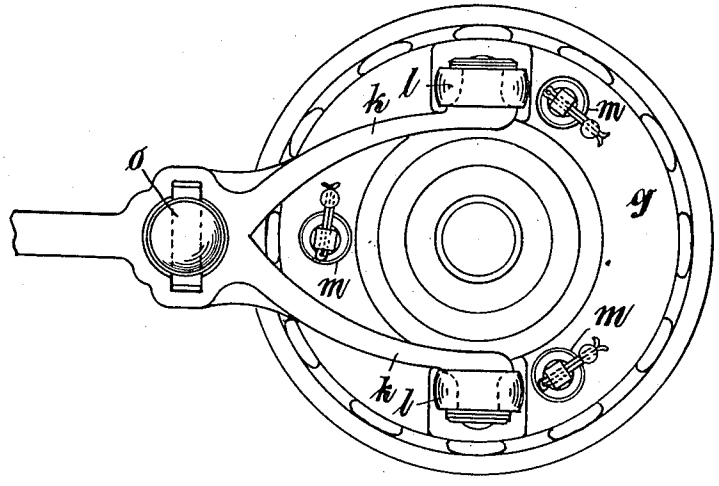


Fig: 2.

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JOSEPH ZEITLIN, OF FULHAM, LONDON, ENGLAND.

VALVE AND VALVE-GEAR FOR INTERNAL-COMBUSTION AND OTHER ENGINES.

1,292,215. Specification of Letters Patent. Patented Jan. 21, 1919.

Application filed January 10, 1917. Serial No. 141,539.

To all whom it may concern:

Be it known that I, JOSEPH ZEITLIN, subject of the Czar of Russia, residing at 115 Bishop's Mansions, Bishops Park road, Fulham, London, S. W., England, have invented new and useful Improvements in Valves and Valve-Gears for Internal-Combustion and other Engines, of which the following is a specification.

This invention relates to ring valves and their operation and correlation with their faces in such a manner that the arrangement is substantially the same as far as operation is concerned as described in the specification of British Letters Patent No. 15,734 of 1913 granted to me, viz., in the fact that each valve is held against its face by means of small rods attached to it, which are always in tension, under spring pressure while separate push rods engage freely the valve for pushing it off its seat, but the details of construction constitute a simplification and improvement of the above arrangement.

In the above cited arrangement, each push rod and each tension rod has to have an independent guide in which it is adapted to slide and the customary fit has to be arranged between the rod and its guide. Therefore each valve would have say, six sliding elements in the case of a valve having three tension and three compression or push rods.

The close fit of each rod in its guide which it is desirable to have does not leave sufficient margin for small errors in manufacture as well as sufficient clearance to allow the valve to freely expand or contract under temperature variations.

By the present invention I am able to diminish the number of sliding contacts to half, while retaining the same number of tension and push rods as before. I am also able to provide the necessary clearances where required for leaving the valve with the necessary freedom of expansion, as well as simplifying and cheapening the manufacture.

In order that the invention may be the better understood I will now proceed to describe the same in relation to the accompanying drawing, reference being had to the letters and figures marked thereon. Like letters refer to like parts in the various figures, in which:—

Figure 1 is a sectional elevation of the upper part of a cylinder with cover, valve and valve operating gear, the firing plug being shown broken off.

Fig. 2 is a plan of the same.

In carrying out my invention I make the push rods *a* hollow instead of solid, and the push rods *a* are adapted to slide in the usual guide bushes *b* with the customary clearance, while the tension rods *c* are disposed within the push rods *a*, the diameter of each rod *c* being made somewhat under the size of the bore of the corresponding push rod *a;* in this way the number of sliding contacts is equal to the number of push rods *a* only. The tension rods having no independent sliding movement do not require any separate guiding means.

The clearance between the diameter of the tension rods *c* and the diameter of the bore of the push rods *a* is ample for accommodating any variation which may be produced in the expansion of the valve *f* and valve seat *d*, therefore leaving the valve quite independent of the guide bushes *b* and the same clearance simultaneously accommodates for any small errors which might occur in the pitch of the holes *e* of the valve *f*, into which the tension rods *c* are secured, and the same applies to the pitch of the guide bushes *b* accommodating the push rods *a*.

Further, a disk or plate *g* of appropriate shape freely engages with the push rods *a*, with or without spigoting means *h*. Through this plate *g* the spring *j* for closing and the lever *k* with rollers *l* for mechanical opening of the valve effect the necessary actions on the valve *f*. The plate *g* is preferably held by the tension rods *c* in contact with the push rods *a* by means of resilient means such as spring washers *m* interposed between the heads of the push rods *a* and the plate *g* and the nuts of the tension rods *c*, thus keeping the tension on the rods *c* practically constant and the push rods *a* continuously in compression and avoiding any strains due to expansion and contraction of these parts owing to temperature variations when holding the valve *f* on its seat. The lever *k* is preferably pivotally mounted on the support *n* by means of a spherical bearing *o* in order to insure uniform pressure on the plate *g* through the rollers *l*.

I claim:—

1. In a valve arrangement of the type

described the combination of a valve having rigidly attached thereto tension rods with independent compression rods disposed co-axially and freely about the said tension rods with a small clearance between the said rods, and an operating plate associated with one end of each of the tension and compression rods.

2. In a valve arrangement of the type described the combination of a valve having tension rods with compression rods disposed co-axially about and independently of the said tension rods with a small clearance between the said rods, an operating plate associated with one end of each of the tension and compression rods, and resilient fastening means for pressing the tension and compression rods into contact with the operating plate.

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

JOSEPH ZEITLIN.

Witnesses:

WALTER CARVER,

DORIS HITCHCOCK.