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Full history of invention of new engine with pivotal piston or half-rotary

I present full with individual periods of new development of engines below histories or pumps with pivotal piston or half-rotary. History include all next phase invention so as emerge.

Primary inspiration , for my next invention was internet page :

<http://www.pivotalengine.com/gallery.html> . On page describe it in which with two stroke engine with pivotal piston, and executed prototypes.

I am inventor new 4 stroke engine with piston timing. Part it with this description of invention: <http://www.new4stroke.com/> .

Very most inspired me , piston whose using inventors on pivotalengine.com. I am tray theoretically employ this pivotal pistons to made 4 stroke timing. Main piston are too pivotal system. Elaboration does not suggest big difficulty and this new solutions are give full 4 stroke engine .

I was made executed drawing from such two along with cylinders inverted for of combustion room . Unfortunately, two smallest crushes are for full on flat drawing possible to presentation that engine wanted not be timing pistons. So, I have added on primary drawing, that two crushes should be in range steering (in line).

I think, that this concept is apprehended(Despite fancy drawing☺). I did not execute time-consuming drawings in 3D, as my concept fast evolved, but I was wanted to divide new capabilities of ideas piston timing.

On this first drawing, important case is changed by I very also –in detail “A”-
This seals put in “cylinder” !,

No in “pistons “in pivotalengine .com original.(If we can call these areas “cylinders” ☺) We will call them for simplification further „ cylinder”

By that reason that is based seals (rings ☺) in cylinder , engine or pump is executable otherwise diametrically. It is possible to execute other about many it technology completely simply and without usage of specialist machine tool – engine it kind. After placing seals ditch in cylinder ,exact this processing falls away completely „ cylinder ”. He its can not surpass roughness from this ditch to height of outstanding crunch only „ cylinder ”. Whole this area on crush practically and room of incinerating can be executed as rigorous in whole not processed cast aluminum . By that reason it can be executed with aluminum in integrity, as it does not subject expenditure, because crunching slides after crush, but not the same, after so far

' cylinder '. It goes behind quite a lot important advantages :it has perfect devolution in the form of slots between aluminum no additional barrier warm outside – but steel or steel cast. Execution of integrity gives fairest ratio of leading from aluminum " cylinder " warm . It no requirement internal processing of surface also not ,, cylinder ”, it will enough accuracy of cast . Process on crunching also ditches not requirement, as they are installed in special casings and on for turn down ,, cylinder ”with gasket. I present different these versions crunching below. Can be executed for big engines ,, cylinder ” as sand cast, or it can be from normal sheet metal **welding**, without that later engine processing. During general repair also, it is not required that engine processing. This way, cylinder is executed lifetime on whole theoretically ,, ” engine, and dismount it from place of installing not requirement. (E.g. it can be in huge engines to foundations concrete ☺) Also some deforming e.g. from thermal fluctuations subsequent and temperatures and on it acting power ,, cylinder ”, despite relatively very big , will not have influence on legal work of engine.

Thus, that crunching is in immovable engine part , very easy and we can cool it effectively e.g. behind assistance of water.

Temperature of crunching will be upper; in this case about several degrees at most only than temperature of water cooling. Temperature off “piston” are simile.

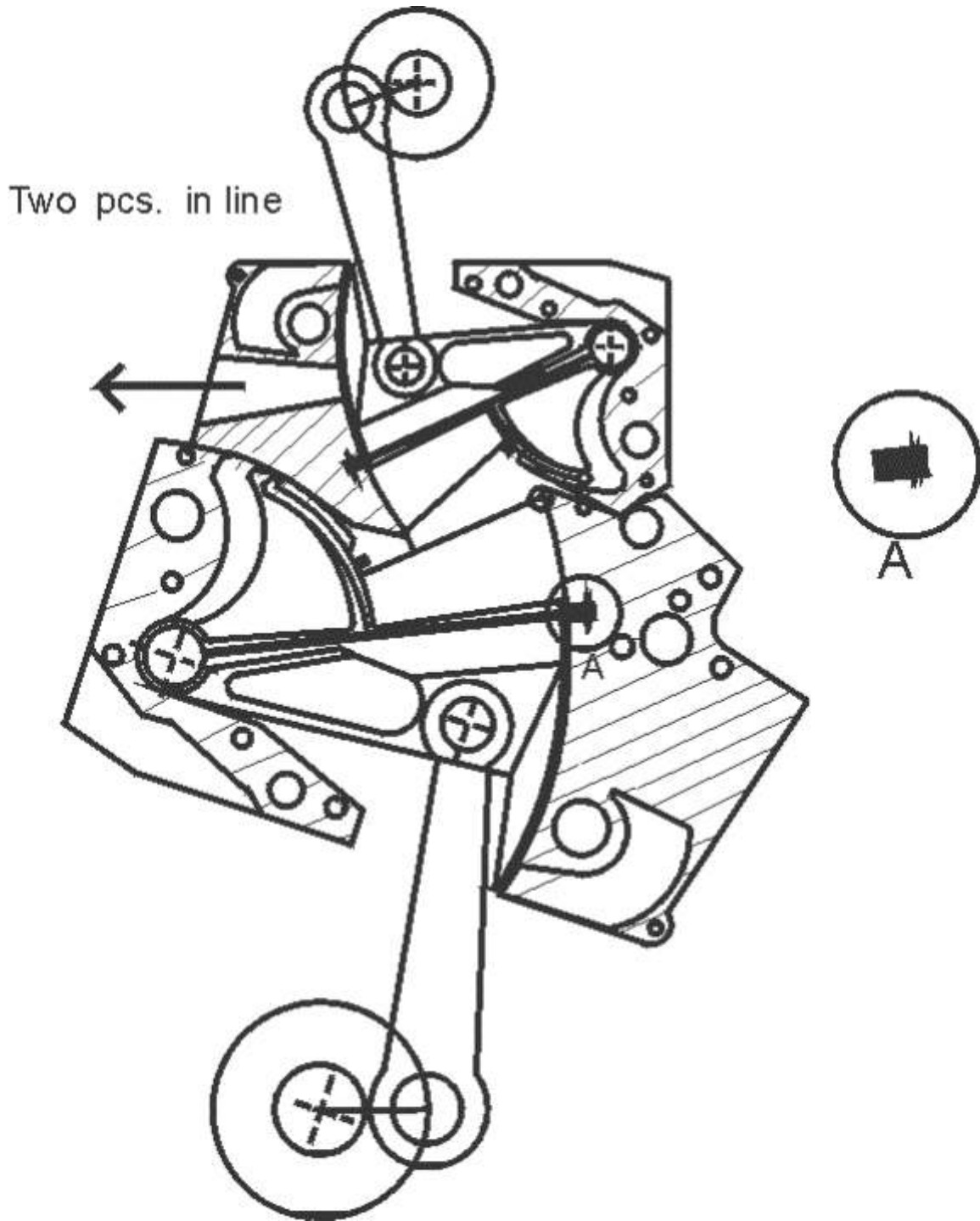
So, it can be executed Teflon from modern materials of types theses or certain ceramics, or special height components.

Elimination of complete oiling of this crunching is in some possible cases , or for example, oiling water. (E.g. without oil compressors) . Normal lubrication are need only closed ball- bearing axle of ”piston” and one rod.

Exchange of this crunching will not suggest difficulty in engine also. Can be so simple at proper designing as exchange of brake fish-plate as cars.

This specificity causes that unoiled will not be at fastest expenditure with their exchanges even great inconvenience seals.

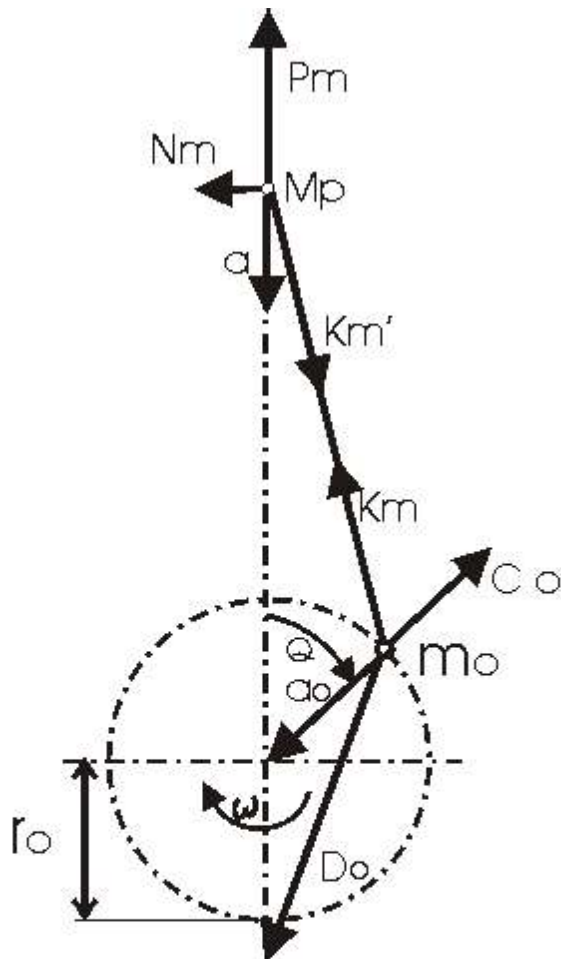
First and I place basic exit drawing of four stroke engine with **in cylinder** below seals.



Main advantage of this engine with pivot piston, there is lateral power that lateral power is transmitted (rescheduled) on turn on pivot axle, form normal closed ball-bearing. It causes this specificity that we can resign at use in pivot of nodding (shaking) from essential oiling opened in conventional engine crush closed ball-bearings.

Can be executed with also it most advantageously cooperating material bearings, that will eliminate capability so far crushes so as thermally expanding friction.

This lateral reaction of power is meant conventional crush for partition of cylinder on following drawing as Nm. It is concentrated in this pivot of turn of pivot piston it reaction.



Resist off inertia concentrated mass of cranksaft -piston mechanic

$$\vec{C}_0 = -m_0 \vec{a}_0$$

$$C_0 = m_0 a_0 = m_0 r_0 \omega^2$$

Surely proficiency is better than proficiency of conventional depositing normal piston-cylinder also rotate bearing. Maximum turns in conventional engine also and they were related constancy of engine with average speed of piston in cylinder. These values are concentrated in solution from in haf-rotary bearings and better boundary parameters may a lot. (For example, they achieve 100 000 turns / min. turbine bearings.) Thus, also that half rotate is one introduction nodding has pivot turn possible and moving out by whole

‘piston’ of water cooling to simple manner.

Such cooling of piston is applicable in conventional engine water too, but execution is complicated in respect technical and there is reason of serious failure on result of leak often and waters with oil mixing.

Here it does not cause leading after pivot of turn pivot great technical difficulty shake and it is executable for relatively small “pistons even.

It swims by whole “piston” after specially executed channels leading water, that cools it superbly and surely it will prevent bed ignition and generation NOx.

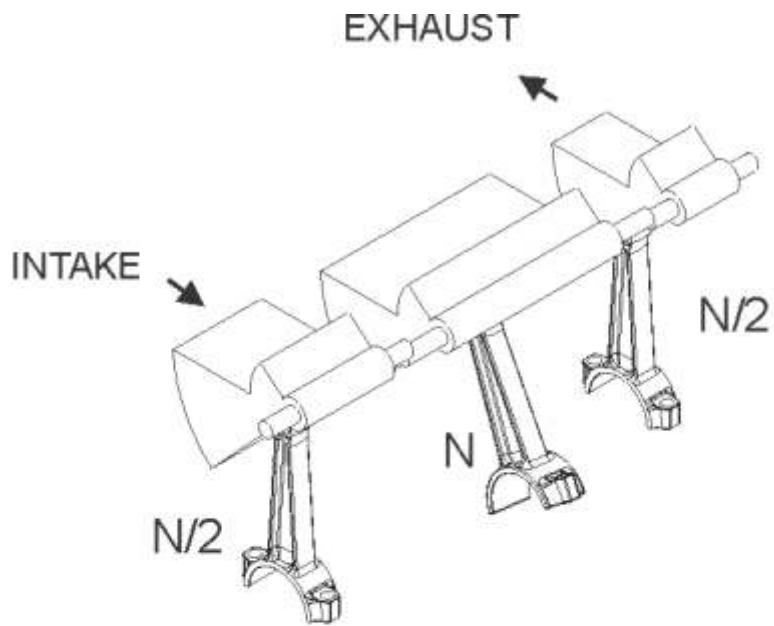
Temperature of partition of crush will not be superior highest too many than water, that will enable teflon application or do not like high temperatures ago similar without oil crush who rather seals.

On good result of conduct of piston in „cylinder”, without additional indispensable margins in traditional engine, in cylinder piston causing „crack”, viability should be greatest and it caused noise mechanical that cracking, at expendable engine particularly It will pass away.

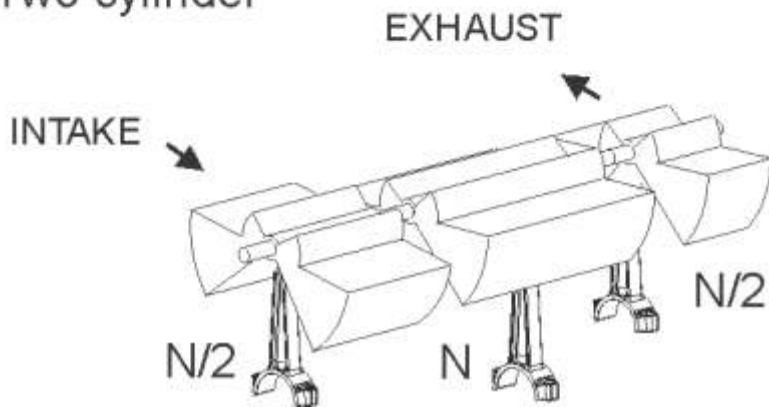
I present **first** version of such engine with under all of below pivot pistons three rods - timing piston 4 stroke.

Next version it double pivot piston but on same already only rod, without no additional on result of doubling amount of pistons rods.

It indirect version, it was developed so as chronologically: name “two cylinder”



"Two cylinder"

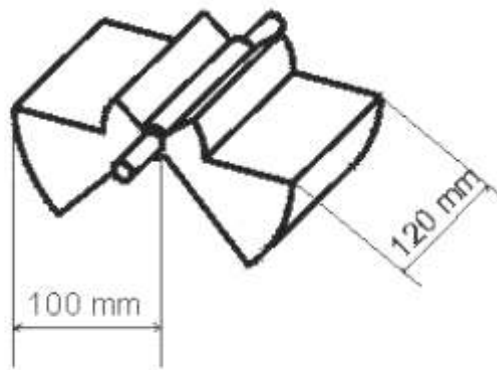


Example of account of capacity of jumping such small engine on next drawing and details of sealing. It was not advanced construction in that time else further.

S piston main
 $3,14 \times 10^2 = 314 \text{ cm}^2$ $314 : 8 = 39,25 \text{ cm}^2$
 S work about $\approx 30 \text{ cm}^2$

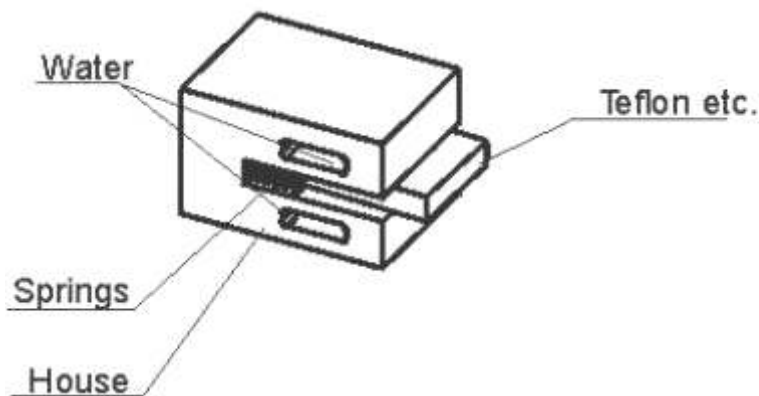
V work one = $30 \times 12 = 360 \text{ cm}^3$

V sum $\sim 700 \text{ cm}^3$



Two "cylinder" only one rod ! And one crank
 Valve "cylinders" on 4 pcs and only 2 rod and 2 crank
 All engine 3 rod and 3 crank
 Pistons water cooled aluminium chrome
 Take power from valve crank

"Rings for Pivot Cylinder"



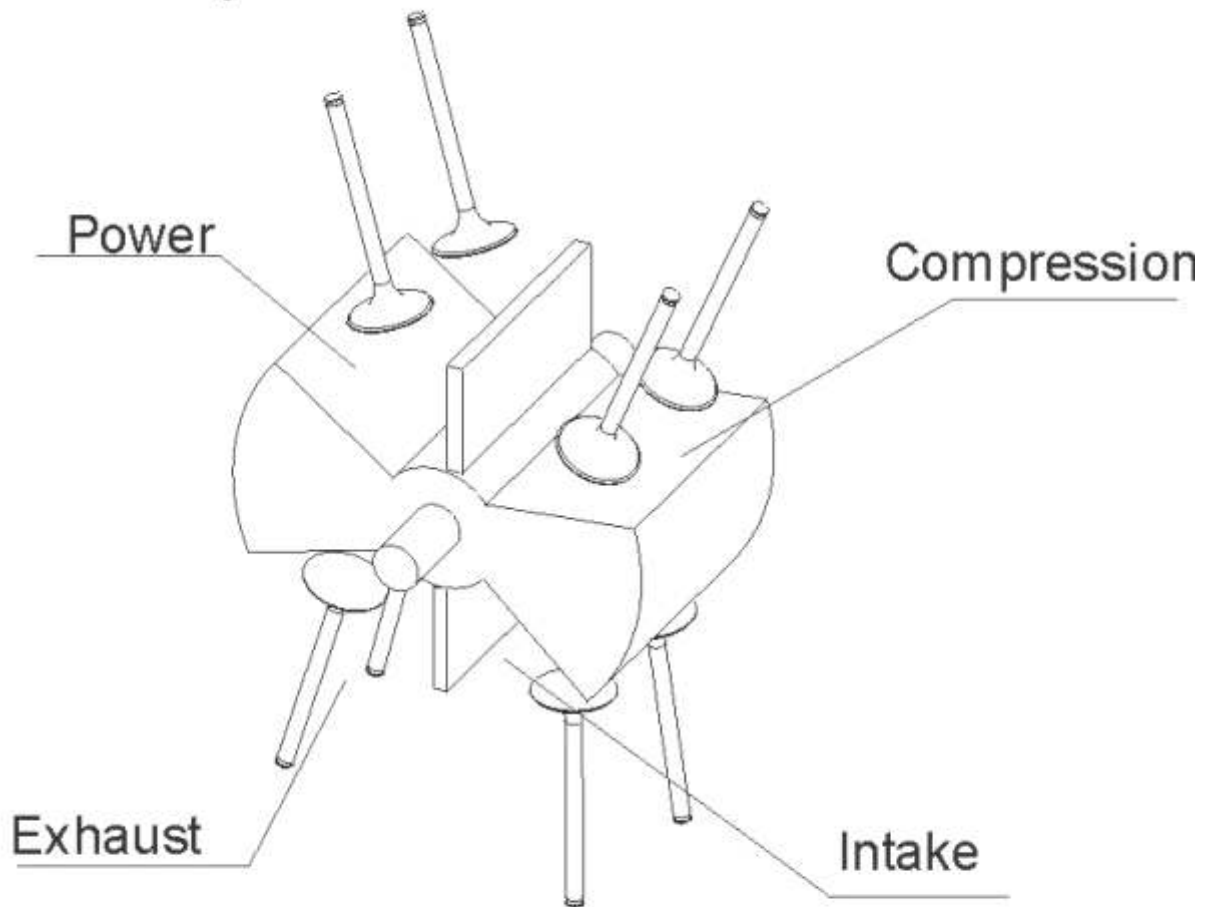
Construction over it thinking further, I have designed as if fourfold "piston pivot".

In order to simplest capabilities of apprehension of these new fourfold ideas complicate drawing very and I have drawn it with traditional popped simplest capabilities of apprehension of these new fourfold ideas "piston pivot"

It is possible to realize these self-service stores of phases of work of engines on fourfold “piston pivot “exactly that cylinder traditional – four stroke four cylinders are intake, compressing, work and exhaust.

On this drawing definite task grants each “cylinder”

Old poped schematic 4 x pivot piston
for easy understand



Full 4 “cylinder” fases

Volume this “piston” = $\sim 0,5 \times 3,14 \times R^2 \times L$

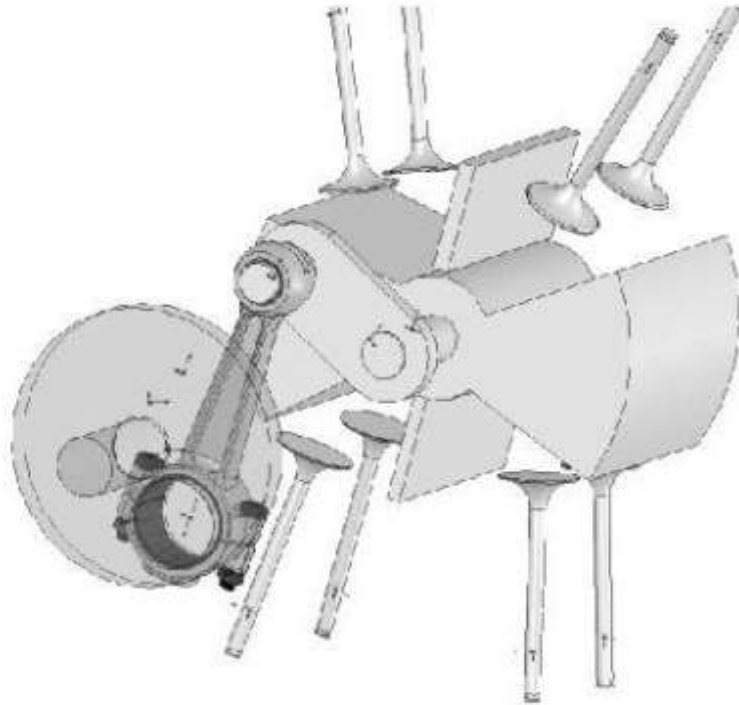
As it was not on such capability “traditional ” enclosure rods, I was must find other manner.

I was put only one rod to a special coherent **lever** believe too four piston pivots This way, has received engine instead of four ... only one rod .!!

It is possible to say about rotate masses with all pivot piston reflexive integrity match that four smallest times are relatively to traditional engine.

Drawing presents this solution below.

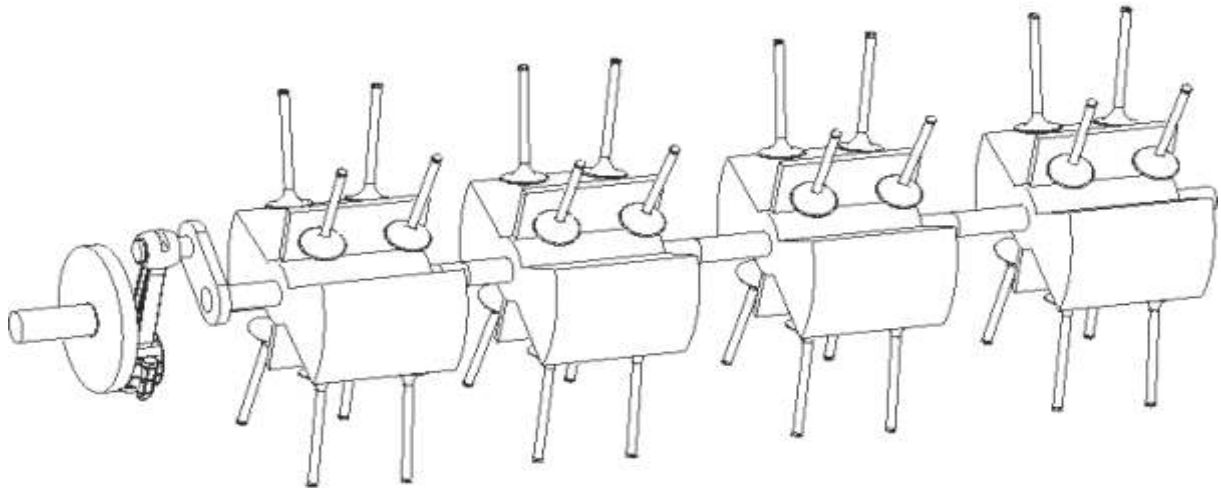
Four cylinder but ONLY one rod
and one crank !!!



Obvious there is simple scheme of base of construction of such engine only. For example, head can look like ratio just the same – rod and to have such close ball-bearing.

As it happens, it is possible to build this trace of reflection going further e.g. with one 16 „cylinder” engine rod and one crank axis .

16 "cylinders" but only ONE ROD
and ONLY ONE CRANK !!!!!!!



Please transcript to PISTON VALVE
16 cylinder are have 3 rod and 3 crank

Regards Andrew Feliks :):)

For simplest apprehension, this engine has been drawn with traditional popped valves. But obvious such engine belongs to execute with "piston valves.

And here field is for this elaboration of corner variant else piston valves.

Obvious on such theses pivot pistons

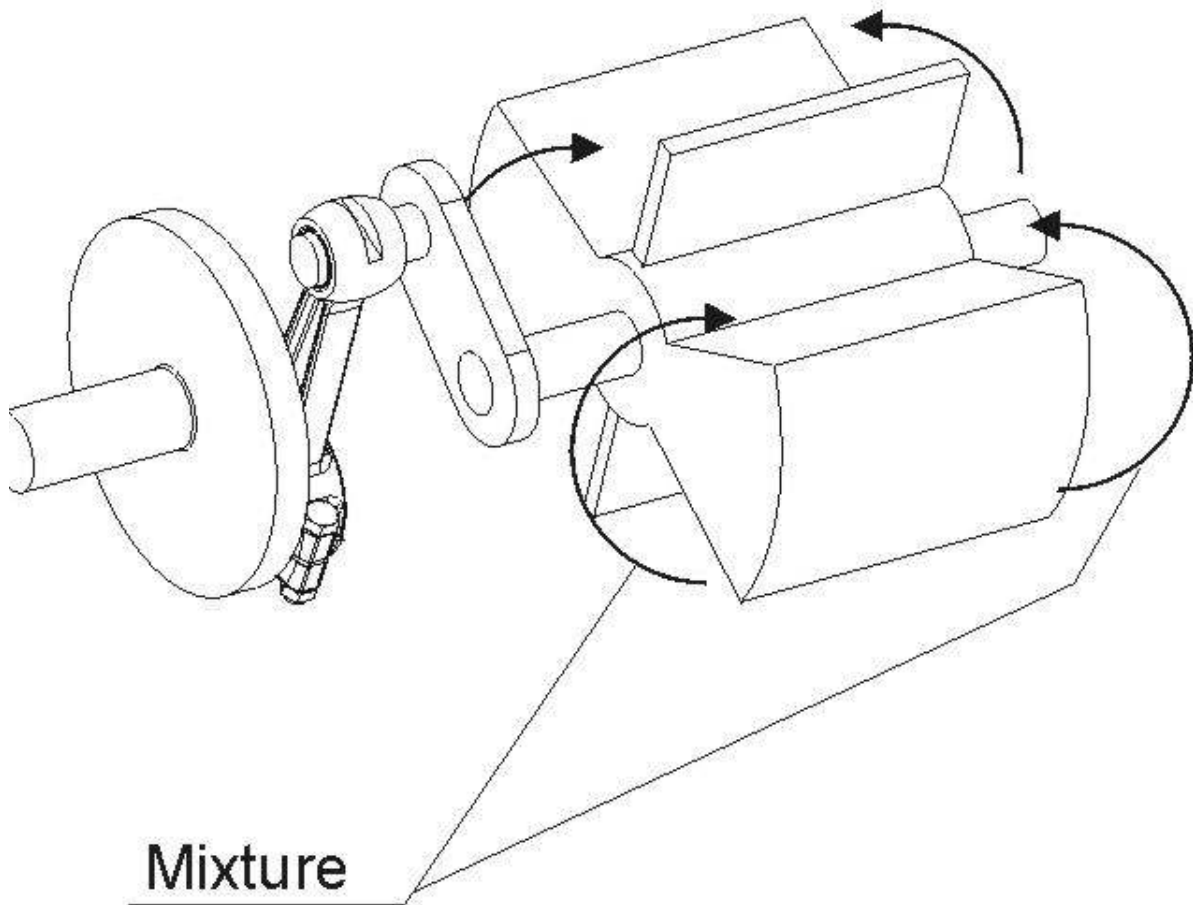
I present versions below two stroke:

This two stroke engine are possible will work without oil.

So far engine two stroke, there was indispensable oil ,was no ecological

Proficiency would be greatest also as area enabled exchange of load ,, " 100%
under piston, but not the same, there must be increased about crankcase so far .

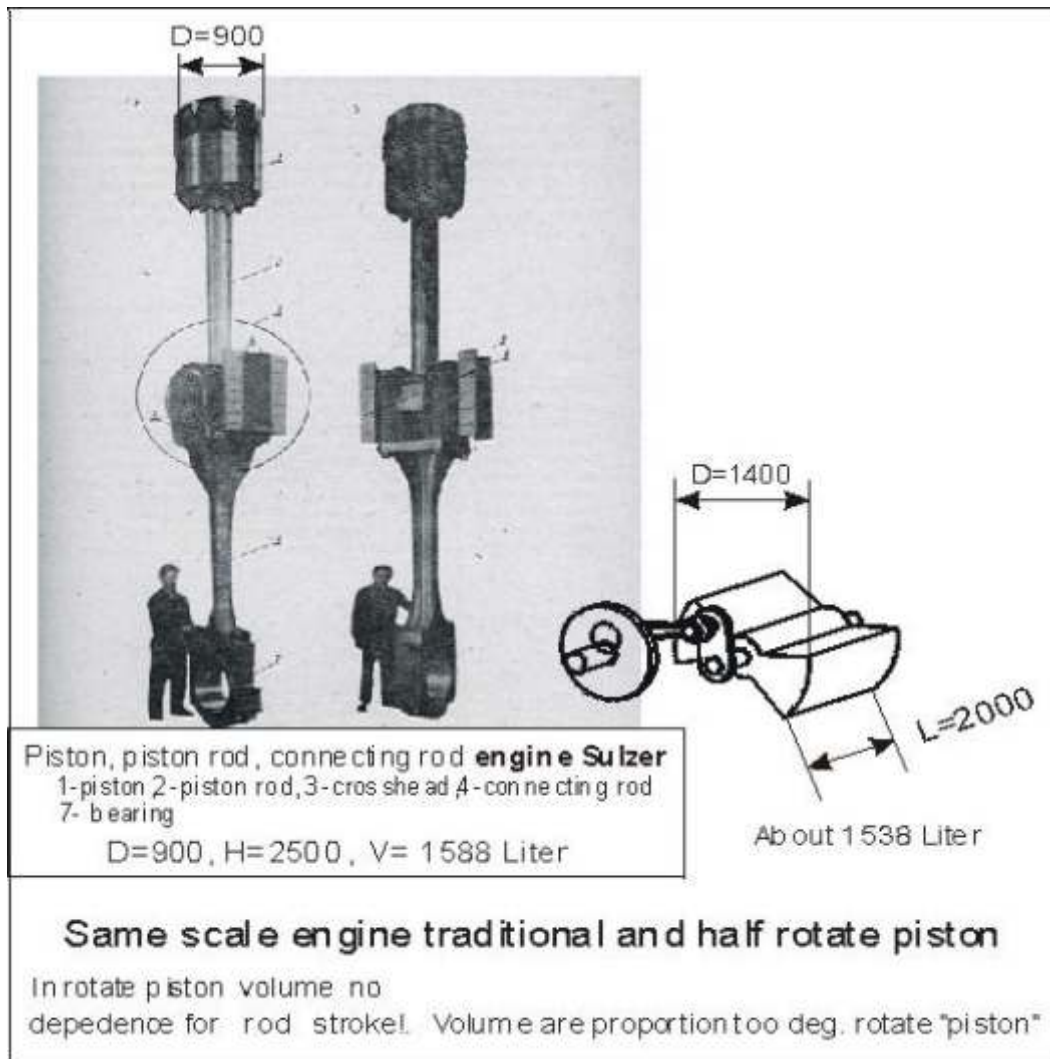
Scheme of operation below:



Such advantages piston pivots in the same scale draw pistons of shipping engines cardsharp wanting show introduce below and piston pivot about the same jumping capacity - both.

Capacity of jumping pivot piston is depended on its corner of corner of turn , not as from stroke of crank axis so far.

Shows from drawing that height of engine will undergo drop several times.



Mechanical processing can be executed method by English company during staying on offing also piston pivot this exact executable even orbital. Here link is and photos from such processing: [In - Situ](#) . It is possible to produce big such engines due to such methods about in garage pivot piston almost , without huge specialist machines and fix-ups. There is important case very playing down cost e.g. for power station such engines, that makes it unbeatable price and for other energy drives efficient and matches.

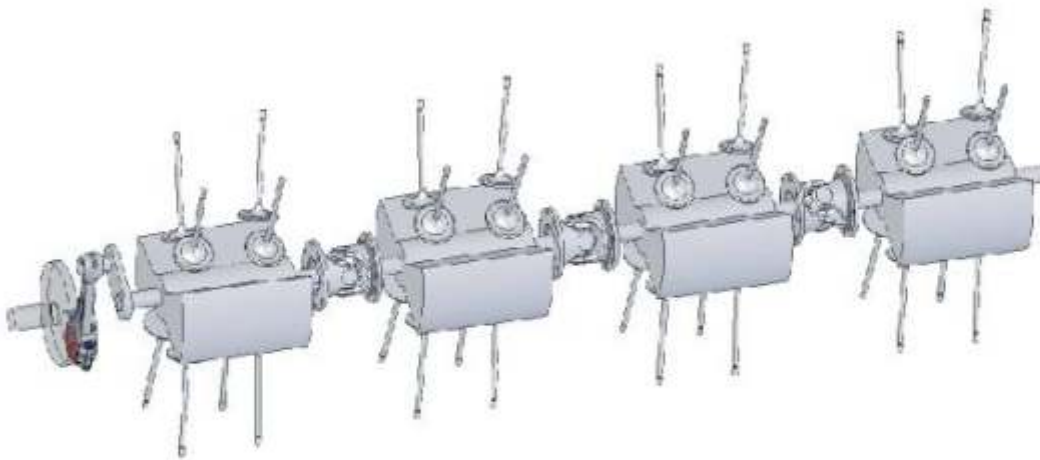
Capital costs can be several times low at this such structure of energy engine of type and can be high through cost of fuels e.g. petroleum even, but can be on similar to present cost fabrication energy totality e.g. carbon level (horizon).

Following manner of dividing and schematic pivot pistons axis main coupling, can be advantageous to many aspects.

E.g. single exchange broken disabled "fourcylinder" will not suggest big difficulty to integrity .

It is possible to substitute it as end even scrap of ordinary tube ended similar joints pivot pistons, and engine will work.

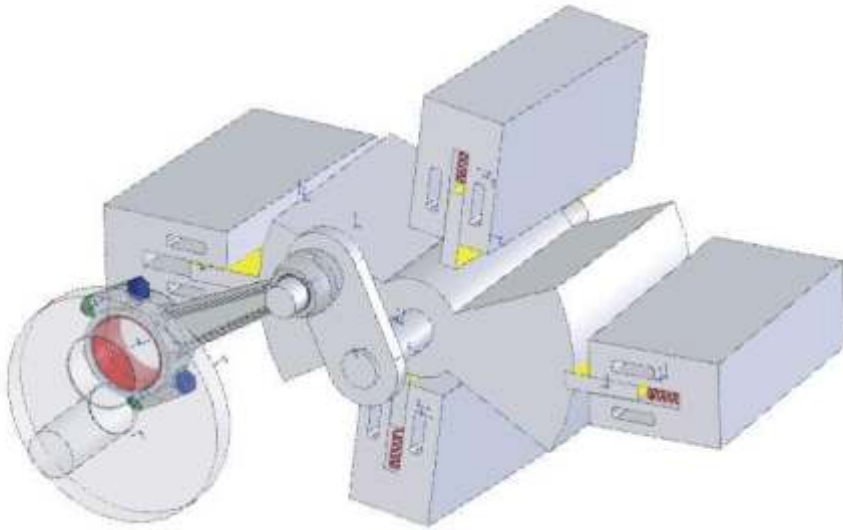
Also if it walks about very in classic shipping drives repeatedly perplexing case very long crank axis „ bend ”, then it is out of time at this solution in whole.



Cardan shaft half rotate piston

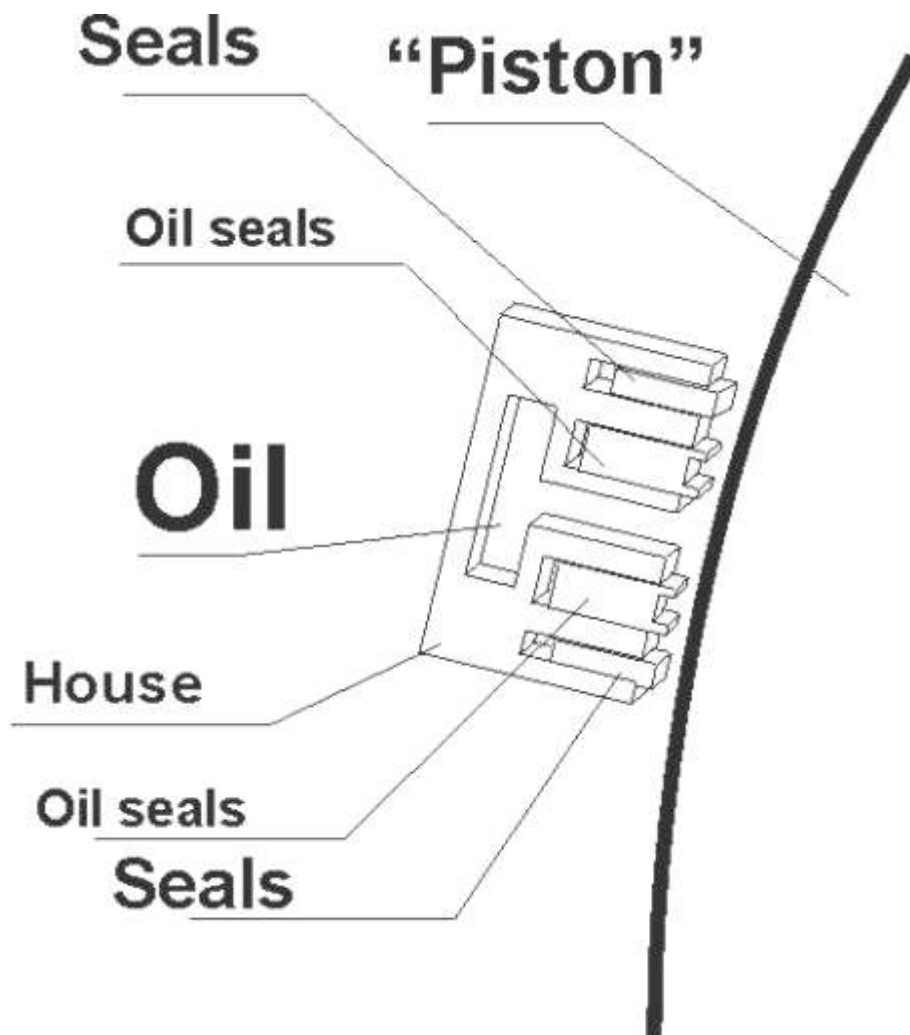


Visual drawing of half rotate pivot with placing main seals below:



Here animation of traffic of this half rotate engine is placed:
<http://www.new4stroke.com/images/Halfrotate1.gif>

Crunching oiled for “traditionalists” oil below, majority so as working hitherto existing seals.



If program from part have available fitted e- Drawings:

<http://www.edrawingsviewer.com/> We can have it to drawn application also 3D:
<http://www.new4stroke.com/images/33.htm>

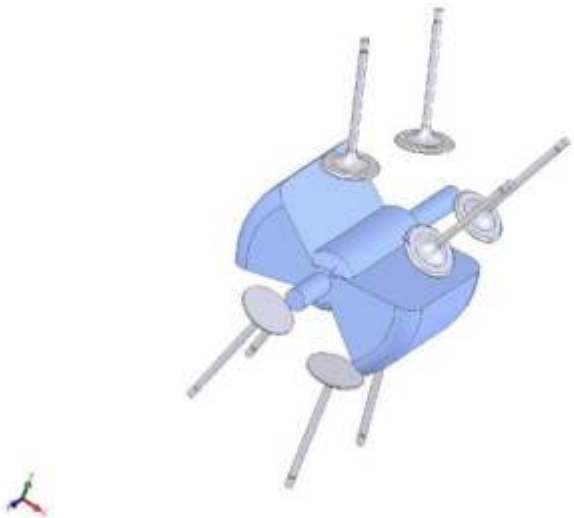
Here, manner of deployment of idea to it on better engine or compressor described over or mum , theoretically and through I engine about pivot piston with very schematically describe invent four area working , driven one rod and one crank.

There is base for farthest deployment this construction and revolts of first prototypes.

Think, that you have become fond of engine about half rotate, or semi-rotary. That not know name accept .

Regards Andrew Feliks

Ps. New "round" version:



And **steam** engine:

