KINO COMPRESSOR WITH GENERATOR USING A SPEED BREAKER

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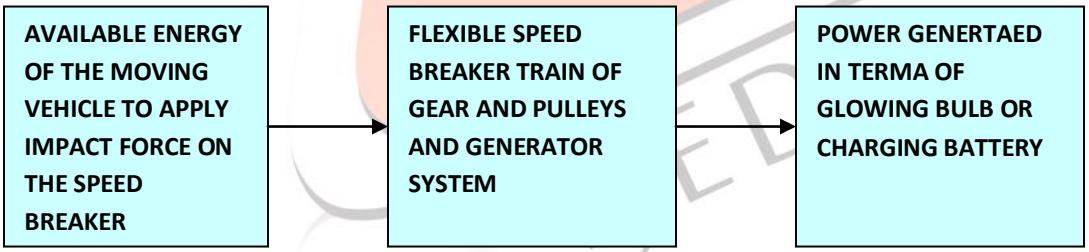
Abstract - The Kino-compressor is specially planned to design and fabricate the conversion unit for utilizing the available unconventional energy source. That is tremendously available energy in low intensity with ample quantity can be utilized for inflating the pressurized air in to the receiver tank. The summation of pressurized air results in creation of high pressure compressed air available for the industrial utilization.The vehicles which are crossing the speed breaker are applying the impact force or thrust on the projected speed breaker. This impact pressure energy can be utilized to actuate the compressor actuator which will compressor the air to increase the air pressure. We receiving not only compress air but also electric current is generated in this mechanism. This source of power can be used at the high way road side passing through the villages or in towns where there is scarcity of electric supply.

Keywords **– compressor, speed breaker, rack and pinion, flywheel, dynamo**

I. INTRODUCTION

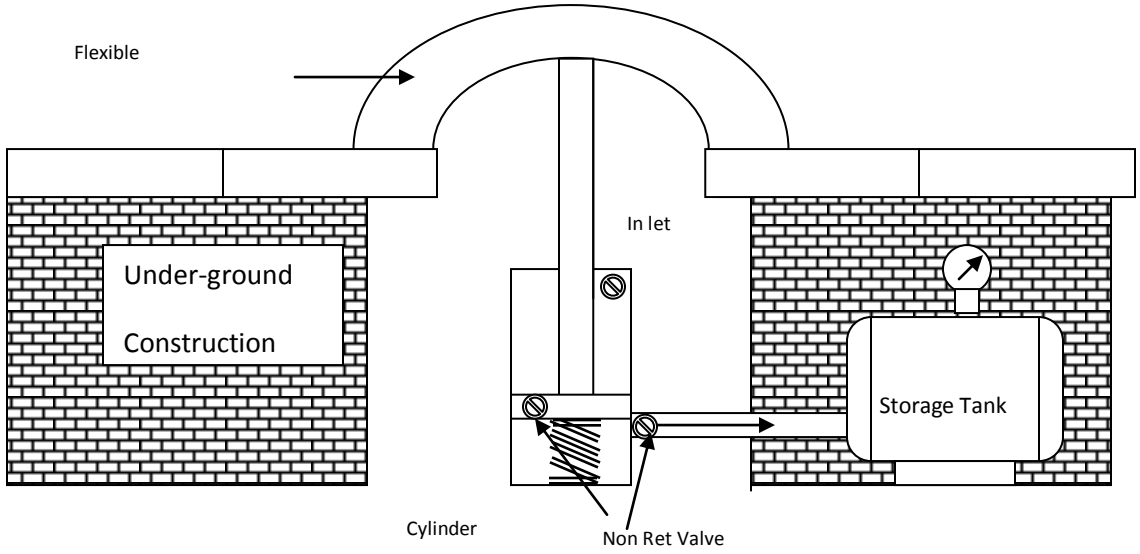
In India there are lot much scope for utilizing nonconventional energy , to utilize this kino compressor is design so energy can be convert by receiving mechanical load as an input and to provide compress air and electricity as output.Kinetic generator means the "Energy in motion when it is suddenly applied with a sort of obstacle, then according to Newton's law for every action there is an equal and opposite reaction. Utilization of this reaction is the basic reason behind the selection of this project work.**"**



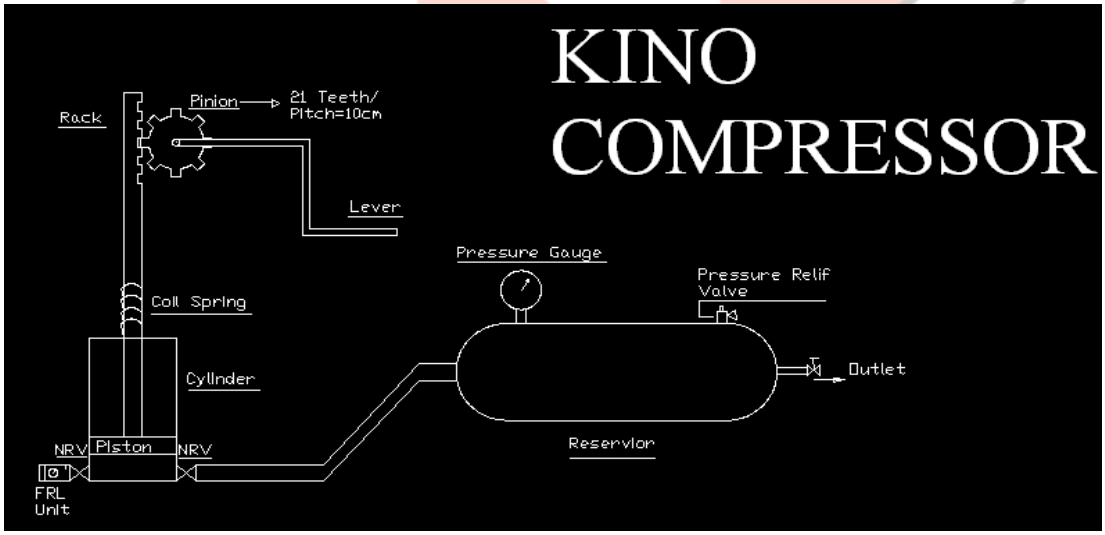
Set up of flow diagram

II. WORKING PRINCIPLE –

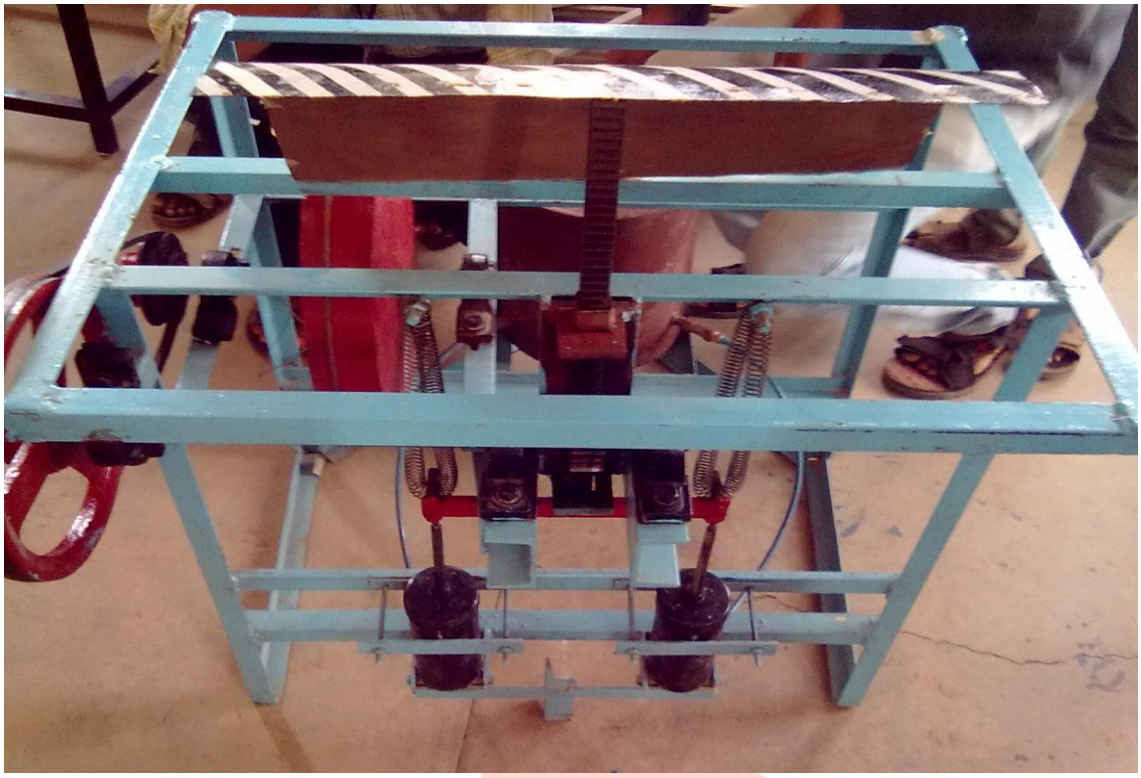
It works on the principle of reciprocating air compressor in which compressor compresses the air by reducing the volume of air that has been isolated.



For kino compressor first important point is how we get reciprocating motion, which is prime in put in the system. For that we use weight of moving vehicles that run on roads. We put our machine under ground of road exactly below speed braker, the head of piston rod (ie.rack in combined case) is bring up to level of road surface. When vehicles move on rack it will be pushed down. The piston is reciprocating in the cylinder. The piston and cylinder arrangement convert reciprocating motion in to air-compression.Kino Electric Converters basically new concept of non-conventional energy generation. It is electro-mechanical energy generating machine. This machine convert reciprocating machine into rotary motion , where pulley is attached with belt and transmitting rotary motion to flywheel . Flywheel transfer the motion and power to dynamo which generate electricity with zero cost.



Actual photo of model



III. DESIGN –

Pedestal bearing calculations as per **design data book**

Fb= M/Z

Fb= 85 N/mm^2

As induced stress is less than allowable stress selection of lever size is safe , where fs= 210 kg/cm^2

Design of cylinder : internal dia**Di-** 7cm , internal air pressure **P**= 5kg/cm^2, max ft=210kg/cm^2

Thickness : 0.8 mm , assume fos as 2 , final thickness t=1.6cm

Outer dia Do=Di+2t=73.2mm

671.7 cm^3 volume store in cylinder per stroke per cylinder, F=1923 N

Torque T= F X radius of pinion = 57690 N-mm , After taking FOS 2.5 , we will get,

T=57690 X 2.5 , **T= 144225 N-mm**

Design of Pinion :

Module m=2.5 , Pressure angle $\Phi = 20^0$, dedendam = 3.125 , working depth =5mm , minimum depth =5.625mm

Thickness of tooth=3.927 , Fillet radius= 1mm

Min no of teeth of pinion for intermittent service & in hand operated operation is 21 as per requirement.

Np=21 teeth , Allowable stress for pinion = 126 N/mm^2

LEWIS Equation for gear Teeth- Wt = fw.b.3.14.m.y

Where , Wt- beam strength of pinion tooth , b-width of gear =25 mm , fw – working stress= 210 N/mm^2 ,

m- module=2.5 , y – tooth form factor = 0.11 ,

Wt = 4945.5N , Induced load coming on gear tooth – T=F X D/2 = 4807 N

Design of Transmission system : Big gear having 97 teeth , small gear having 17 teeth , small gear rotation =5.7

Small pulley rotation =15.93 , Flywheel rotate at speed 250 rpm , this calculations will get rpm of dynamo

RPM of dynamo= 1468.
Calculations for Torque induced shaft:
Length of lever=700mm , human applied load=20kg ,T=FxL=137340N-mm,
SAE 1040 SAE(Society of Automobile Engineering)
Design of gear shaft : Max bending moment =208120N-mm, max torque = 137340N-mm,
Equalent torque =249351N-mm
Length V-belt=55.89 inch , Free length spring=227.5mm, Solid length= 55mm

IV. BILL OF MATERIAL

S.O.	COMPONENT	MAT. CODE	MATERIAL
1	Piston	C-40	Aluminum
2	Cylinder	C-40	Aluminum
3	Piston rod	C-40	Aluminum
4	Angles	C-25	M.S.
5	Table	C-30	M.S.
6	Push linkage	C-30	M.S.
7	Receiver tank	C-40	MS
8	Tank covers	C-40	MS
9	Pressure gauge	STD	10 kg / cm2
10	Spring	C-40	Spring steel
11	Nut bolts	C-25	M.S.
12	Washer	C-25	M.S.
16	Pipe fitting		Brass
17	Flexible pipes		PVC rubber

V. RESULTS AND DISCUSSIONS :

- It is used in mines to operate pneumatic appliances , pneumatic lifts and elevators ,for starting the IC engine ,for street lighting.
- it can also use to inflating automobile wheel tyres in road side by repair shop and to drive compressed air motor.
- The biggest advantage of this model is its not works on external power supply , it is fully mechanical mechanism which works underground by taking input as mechanical load only and provide compressed air and electricity.
- Its maintenance is little costly though but despised that result oriented model.

VI. REFERENCES

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