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TITLE:

AUTOMOBILES #4

AIR CARS

022-AU4 AUTOMOBILES # 4 (AIR CARS) --- A comprehensive briefing on the controversy of compressed-air engines. Several of these claim to be "perpetual motion" in that they allegedly operate indefinitely without recharging...Lee Rogers..T. & G. Miller.. King.. Troyan..Bill Truitt..R. Wale.. Yeh.. Stewart..J. Rilett..More ! 33 pp..

Inventor says he can revolutionize the auto industry with his . . .

Engine that runs on air

Inventor George Miller says his incredible new auto engine will cut costly fuel bills, solve pollution problems and stop wars — it's powered by air.

"It would run forever," said the gray-haired retiree.

His amazing engine once whirled under the hood of a 1972 Opel. It is medium-size and has four cylinders.

A retired coal miner who lives on $465-a-month Social Security disability payments, Miller envisions his air engine as a solution to the Middle East wars, pollution and fuel costs.

"Why else are those people fighting for that land over there?" he asked. "Nobody would want it except for the oil and gas."

Though his miracle engine has caught the eye of the U.S. government, politicians, the press and knowledgeable engineers, no one is breaking down his door.

An agency called CENTECH that helps people with new ideas sent its director, Barry Dent, to Johnstown, Pa., to look at Miller's miracle engine.

"We have not made a final judgment as to whether the product has merit," Dent said.

"Mr. Miller professes his engine will produce more energy than it consumes.

"But my engineer felt that was not possible." However, he said, in all fairness to Mr. Miller he'd reserve final judgment until he sees the thing in full operation.

"We have been involved in a number of projects that we questioned at first glance but which have become successful and resulted in jobs," Dent said.

Miller has applied for government grants, spoken to private investors and written to Honda Motor Co. in Japan. Honda never replied and the others told him "to come back and talk anytime."

"I think I would have done better with the government if I didn't have all the answers," said the mechanical whiz.

"Engineers say you can't get something for nothing, but I can prove it to them. This thing works, but if I tell them how it works, they won't need me."

INVENTOR George Miller says his engine will run forever.

Best place to get a drink

Already known for Dixieland jazz, fantastic food and the Mardi Gras, the city of New Orleans has won new fame — best drinking water in America.

The international water taste-test challenge kicked off the annual conference of the American Water Works Association.

Miami, Fla., finished second in the clear water contest and Dallas, Tex., was third.

Battery cost arm and a leg

A man convicted of stealing batteries escaped a prison sentence, but paid a gruesome price for his crime — they chopped off a hand and a foot.

Mohamed Edam Mohamed became the fourth thief to undergo a double amputation since the introduction of Islamic law in Sudan.

A government doctor sliced off his right hand and left foot in a Khartoum prison. He had six prior convictions for theft.

INVENTOR REFUSES BILLION DOLLAR OFFER!

AUTO RUNS ON AIR!

By Gilbert Lawrence

"...Actually, they offered me over a billion dollars — but I was afraid the big three would just buy it up and never have any intentions of releasing it to the consumer!"

— Lee Rogers, Inventor

The following feature, to many American Consumers, may seem difficult to believe. — It none the less is true! This is not just a story of one man's desire to overcome the suppression of massive odds against himself, but, entwined within his destiny and within his hands he may hold the future destiny of America and the free world. You may never need ask again, "Whatever happened to good old American ingenuity?...Where are the modern day Graham Bells, the Wright Brothers, Henry Fords and the likes?"

* * *

No doubt, we have all heard the expression "Don't look a gift horse in the mouth," but, who among us could look a billion dollar plus offer in the face and say - NO! Well, it may sound like a good plot for a television series (we all remember "The Millionaire"), but it's no fiction, it happens to be the truth. "The Big Three," apparently pooled their automotive fortunes and efforts to the tune of over one billion agricultural engineer, criticize Rogers' invention, saying, "Rogers might just as well use a horse to turn a windmill!" Further, Bagnall stated; "I would roughly estimate that it would take twice as much energy to fill the tanks and compress the air as the engine could ever produce. After all," Bagnall continued, "Rogers will have to use more fuel to compress the tanks of air than the auto normally would use!" Rogers, not one to be at a loss for words, countered Bagnall's attack with a chuckle, "the compressor will be continually fueled simply by the power from the engine itself."

* * *

As Rogers later stated in an exclusive Consumers Guide interview, "I work on one problem at a time. First, they told me it was impossible to run an auto engine on just plain 'pure' simple air and I said, Why? After all," as Lee Rogers continued, "All gasoline does is create a 'hot' explosion driving the pistons up and down, and the only reason it's a hot explosion is because it's ignited. So, I got to thinking, no reason why the air has to be hot! Why not just regular cool everyday air like you and I

photo courtesy Fort Myers, Florida News Press

LEE ROGERS OF IONA EXPLAINS HOW AIR POWERS HIS CAR
...no other fuel is used to run the vehicle.

Lee Rogers interview

Continued from page 4

Lee Rogers plans to build a onverter kit," that will adapt to any merican built auto, mass produce em, and sell them outright. He feels at if he builds and sells them on his n he can protect his patent, help out e consumer, save his country from the rab oil squeeze and make a mfortable sum of money to live on.

* * *

He touts his invention as one solution smog and the energy crisis and says it when it is completed it will run as t as gasoline-powered engines and olutionize the industry.

"Ford Motors told me the engine uld never run on air. They said it's igned to run on combustion only, ated by a fuel," Rogers adds, body believed it would work ause they said if it would work they uld have done it a long time ago!"

n the process of designing and lding his perpetual-motion machine, Rogers had to have every part made arious machine shops. Many times various parts had to be modified, esigned, or completely remade.

My invention would turn inflation r around. If enough American ple know about it they're going to h for it. The auto companies could e created this ten years ago. Frank y, my neighbor, who has assisted n the assembly of the engine, and I t change the country by ourselves. need help from everyone to put sure on the auto industry to give my ne a chance."

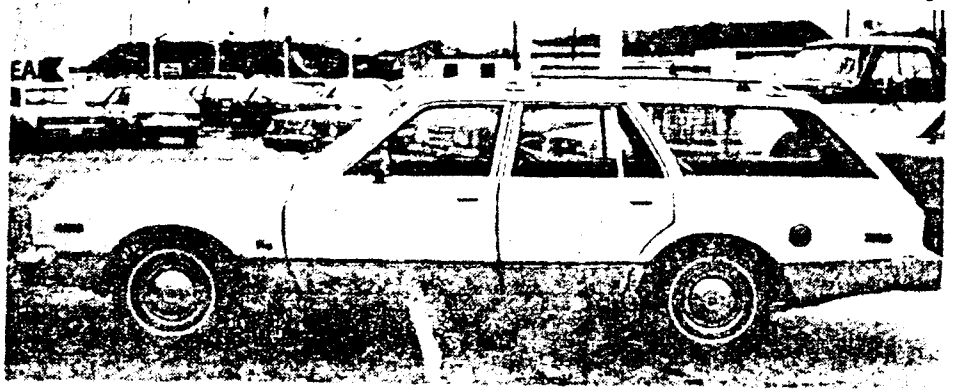
Rogers' '77 Dodge is currently running at 96% H.P. efficiency, compared to only 26% for gas powered vehicles.

Lee Rogers' air-powered conversion kit (when manufactured), could be adapted to any American-made auto and would sell for about $1,000. The kit could be installed by your local mechanic at a nearby gas station. The car keeps its battery to power the lights, accessories and to start up the air compressor.

Now, assuming you have bought the conversion kit, had it installed, you are now ready for your initial test run. But, first you must spend $14 for a tank of nitrogen to charge all four air tanks that are mounted where the gas tank used to be. You have the main tank, and the other three are reserves. The compressor is fueled simply by power from the engine and as the engine runs, it's constantly rebuilding its own air supply. As one tank empties, another is being filled...and so on. When the charge gets up to 500 P.S.I., the auto is ready for the highway. The nitrogen is a one time purchase. It also cleans, blows out all oil and gas residue, cleaning the valves, the engine and everything else right out to the exhaust.

Now, step into the car, turn on the key give it some air (step on the former gas pedal) and away you go.

The whole concept of the perpetual-motion machine is based loosely on the same theory of an air-gun. The former gas pedal acts like a trigger and gives you various speeds when you press down on it.



LEE ROGERS has adapted his 1977 Dodge stationwagon (similar to photo shown here) with an airpowered engine that has the auto industry worried.

photo BILL LANGHORST

CURRENT PROBLEM

What stands between Lee Rogers marketing the converter kits now or at some time in the near future, is a slight problem he hopes to soon solve. At low speeds, the auto uses the air pressure up in about 20 minutes.

"The engine doesn't run fast enough at 5 to 15 mph to rebuild the air supply. The air pressure has to reach about 2,000 RPM's to remake its own supply." Lee chuckles and adds, "But it's merely a matter of gearing and some slight changes. I'm very close to solving the problem. Very close," he adds and grins.

And grin he should. Lee is on the verge of creating complete havoc in the automotive world that for years has been dependent on the oil and gas companies. And should his design work, the hiss of his air exhausts sweeping across the nation will be topped only by the screaming and yelling of the money hungry oil and gas magnates pulling their hair out.

* * *

MODERN DAY HERO

In this day and age when heroes are a rarity, Lee Rogers is certainly destined to be a cult hero. The 41-year old building contractor is gaining a cult following with engineers, mechanics and farmers who call day and night and even stop by his house, the location of which Rogers is trying to keep 'Top Secret.'

The usually calm, soft-spoken man sometimes breaks into a hearty laugh when he recalls what some people have gone through to beg a glimpse of the air-powered engine or just to shake the inventor's hand. A farmer flew in from Wisconsin and wanted to buy 18 conversion kits for his tractors; when he arrived he still had on his bib overalls.

An older couple named Rogers

Continued on page 8

dars! All they wanted in return were the absolute patent rights owned and already registered to Lee Rogers, for an automobile that literally runs on air.

Rogers, a forty-one year old residential contractor, from Iona, Florida had one underlying fear. He had a near obsessive concern that the automotive industry might merely 'shelve' his revolutionary invention and keep it off the market. Rogers might well be right, if all indications prove correct! His idea to operate any regular gas designed engine on compressed air could cut America's massive dependence upon foreign oil. Because, as Lee Rogers says, "It's probably the closest thing to a perpetual motion machine that may ever be invented."

* * *

News of Lee Rogers revolutionary design, reached Consumers Guide Editors and immediately we went to work to separate fact from rumor. As I quickly found out, this wasn't an easy task. For some reason, there almost seemed to be a "Media Black-Out," when it came to acquiring information on this potential block-busting invention.

* * *

How could it be, I asked myself; if in fact, as Lee Rogers had stated, his invention was probably the closest thing ever to a perpetual motion machine, that no one, including AP, UPI, NBC, CBS, and ABC had not grabbed up this little gem and really ran the distance.

For whatever their fears or reservations the balance of the media seemingly held back, and given the initiative of time, the Guide continued to forge ahead to expose the inventive genius -- or fraud of Lee Rogers.

As the days grew into several weeks, bit by bit, piece by piece, the Rogers story started coming together. Many unanswered questions and doubts were investigated...and the solutions to the skeptics questions were answered with hard facts.

* * *

Example: why did Dr. Larry Bagnall, regular cool everyday air like you and I breathe?"

"Sounds good," everyone would say, "but it'll never work!" "Well, I made it work! I proved it! I not only started it, and idled it (for many, many hours), but I took 'em for a drive in it. -- Now let 'em tell me it can't work!"

* * *

State Rep. Paul Nuckolls, (R) Fort Myers, who just happens to be on the House Agricultural Committee, sees the Rogers invention as a potential revolutionary breakthrough for the farming industry. Without the high cost of fuel, that the farmers are presently faced with, food prices could be slashed.

* * *

Rep. Nuckolls personal aid, Jim Siford, stated to The Guide, "I remember the day we all went down to Lee's for a look. A whole group of us were there. We had heard all types of rumors, and Mr. Rogers walked out to his garage with us explaining, 'it just simply runs on air.' One gent who was there with us, who I dare not name, said, 'if that thing even starts, I'll consider it a miracle!'

"Well, Mr. Rogers opens up garage door and there sits a reg looking 1977 Dodge stationwa After showing us the modifications, Rogers hops in and not only starts up, he backs down his driveway waves to us, as he drives off down street. You could have knocked u over with a feather!" Siford conclu

* * *

(EDITOR'S NOTE: Accompan this article is the Guide exclu interview with Lee Rogers.)

Consumers Guide interview with inventor Lee Rogers:

Air-powered auto is a reality!

By JERRY KEEFE

LEE ROGERS is a resident of Iona, Florida, a small residential area outside Ft. Myers. He believes he's invented a car that runs on compressed air; no fuel, no combustion, just the power of air trying to free itself from the cylinders of a V-8 engine.

Rogers' idea to run an automobile on compressed air was sparked by the energy crunch two years ago. This idea has been fueled by his technical progress on the engine, and his desire to change the nature of the auto industry, thus freeing the consumer of spiraling gasoline costs and cut America's umbilical cord with the energy-rich Arab nations.

Lee began by tinkering with his 1977 Dodge Aspen station wagon. He removed all the gasoline components from his car's engine, including the carburetor, spark plugs, gas tank, fuel pump and exhaust system.

The old Dodge was originally fueled by pressurized air tanks that Rogers had purchased. He has since designed an air compressor that provides a continuous supply of air to the engine. A conversion engine block, pumping pressurized air into the cylinders -- and it works!

* * *

"Simply, it just runs on air instead of gas," the 41-year old former home builder says of his first invention. "Instead of gas, it just has air going in to drive the pistons up and down. It's so damn simple nobody believes it."

* * *

That includes Jimmy Carter, the Department of Energy, Ralph Nader and the major U.S. car manufacturers, all of whom Rogers has contacted with little or no response.

Rogers contacted the major auto companies last year and tried to interest them in his idea. But, they apparently wrote him off as a nut and ignored his request to come and see his perpetual motion machine.

* * *

Apparently the Big Three believe him now. After a great deal of publicity and documented facts, they have pooled their bargaining efforts and offered him "over a billion dollars" for his patent.

* * *

"Chrysler and General Motors asked me to send it to them, but they didn't believe I could turn it (the engine) over." Rogers says with amusement. "He can let it idle eight hours a day or m take it on a test run and reach speeds to 80-miles per hour. And when look at the engine, it has a cool appearance to it and is cold to touch."

"There's a couple little tricks to invention that I haven't told nobo My wife doesn't even know about Like I told Chrysler, if you had this you could be No. 1 instead of being the brink of bankruptcy. They s 'Well, send it to us. We don't expec to run.' But they want me to practi sign the patent over to them."

And Rogers has his engine paten to the hilt. He has about $7,000 of own money in his own invention so he says.

Mr. Rogers fears that if the big a companies did buy his creation, t might hold back the production of a that runs for years with no inter combustion or tune-ups.

"And if they did make this car, wh is the average consumer going to get $16,000 or $20,000 to buy on Rogers asks.

Continued on

to runs on air

Continued from page 5

rove down from North Carolina, imply to congratulate another Rogers. nd on and on it goes...phone calls, isitors, TV, radio and newspaper eporters...all hoping to catch a glimpse f the Dodge running on air. All the ttention has built up to the point where ogers is finding a little privacy hard to ome by.

He has an unlisted phone humber, nd for some, the journey to see the erpetual-motion machine ends disappointment. Lee Rogers attorney as insisted that all viewing by nknowns be halted and that his ecret" be guarded and kept under lock nd key.

Years from now, we may be breathing ean air as we sit on our porch in a ocking chair...telling our grandchild-n about the legend of Lee Rogers and ow he slew the giants of the auto dustry with his creation of a erpetual-motion machine that volutionized the auto industry and st possibly saved mankind from alking the face of the earth with a gas ask and a tank of oxygen strapped to s back to breathe with.

*

Note: In our conversation with Mr. Rogers he is expressed a concern for the preservation of his rivacy, in order that he may maintain some mblance of normal life. Thus, in accordance ith Mr. Rogers wishes, Consumers Guide will ot publish any direct contact information. hould you desire to correspond with Mr. Rogers, ease write to:

Lee Rogers
c/o Consumers Guide
P.O Box 2700
Toledo, Ohio 43606

The Guide will forward all correspondence to r. Rogers.

NOTES BY T.F.E.P.

EINSTEIN SAID ENERGY IS NEITHER CREATED NOR DESTROYED. THIS SEEMS TO BE IN AGREEMENT WITH THIS ARTICLE BY GIL LAWRENCE. SUCH A COMPRESSED AIR POWER SOURCE OFFERS THE MEANS TO UTILIZE ENERGY THRU MANIPULATION, WITHOUT DISSIPATING OR EXPENDING IT. THE POWER NEEDED TO RECOMPRESS IS MINIMAL BECAUSE SUCH RECOMPRESSION IS NOT FROM ATMOSPHERIC PRESSURE WAY BACK UP TO TANK PRESSURE. IN THE POWER STROKE LITTLE DECOMPRESSION TAKES PLACE COMPARED TO THE AMOUNT OF AIR AND THE PRESSURE OF IT AVAILABLE IN THE TANK. IN OTHER WORDS THE ENERGY REQUIRED TO PERFORM THE POWER STROKE IN ADDITION TO THE AMOUNT OF ENERGY REQUIRED TO RECOMPRESS AFTER THE POWER STROKE IS A VERY SMALL AMOUNT COMPARED TO THE AMOUNT AVAILABLE IN THE SUPPLY TANK. THE PROBLEM THEN BECOMES NOT WHETHER OR NOT THERE IS ENOUGH POWER AVAILABLE. CLEARLY THE ONLY PROBLEM IS IN DEVELOPING THE HARDWARE NECESSARY TO MANIPULATE THE AVAILABLE ENERGY WITHOUT LETTING IT SLIP THRU OUR FINGERS.

COMPRESSED AIR VEHICLE DEMONSTRATED

My local newspaper ran a picture on June 4,1980 that showed a compressed air car being demonstrated in Times Square, NYC. There was no story with the picture. The caption says the car was built by Terry Miller of Crestline, Kansas for about $850. He says it costs 2¢/mi to run, cruises at 29 mph, & has a range of 10 mi. He calls it a 2 passenger car, but in the photo I can't see anyplace where a 2nd person cd sit.

Judging by the picture only: The "car" is a 3 wheeler, a bare tricycle with no body over it. There is a single wheel in front, & it's steered with a tiller rather than with a steering wheel. I see no pedals; I wonder if it has brakes. Several large pressure tanks are visible. I make out 3 & there may be 1 or 2 more. There are a number of hoses & 2 gauges near the driver's seat. [illegible] wheel, which looks like [illegible] feet in diameter, is very prominent on the side. This may be a [illegible] & is probably part of the transmission.

So clearly what this is, is not a highly developed model, but just a rough test bed on which Miller is trying out air cobbled together propulsion system. I have no further information on this vehicle.

[illegible] AIR VEHICLE [illegible]

A compressed air propulsion system wd consist of a number of pressure tanks carried in a vehicle. The compressed air wd be released thru a pressure reduction valve into an air motor that operates at a much lower pressure, e.g. [illegible] air drive tools operate at 90 pounds per square inch (psi) air. The air motor wd drive the vehicle thru a [illegible] transmission.

An especially attractive air motor [illegible] described in [illegible], March 197[illegible], [illegible] [illegible] Kid's [illegible] cylinder [illegible] [illegible] psi air. [illegible] efficiency of around [illegible] [illegible] (like a steam engine) [illegible], with a maximum of about 1000 rpm. [illegible] it cd be [illegible] directly to the drive wheels of a vehicle w/ [illegible] its speed [illegible] right down to zero.

To recharge the tanks in your vehicle, you wd have an air compressor at home powered by wind, water power, electricity, or some other energy source. You use the compressor to pump the tanks up to their highest safe pressure. Or you cd buy compressed air or other gases from a commercial source. But pure gases such as [illegible] wd generally be more expensive than air. Liquified gases wd have a higher energy density than compressed gases, but, since liquification consumes more energy, liquified gases wd probably cost more.

As you drive, the pressure in the tanks wd drop until it reached some level above the operating pressure of the air motor where it wd no longer have enuf power to turn the motor. That wd mark the limit of the vehicle's range. The energy storage capacity, & consequently the range, wd be proportional to the max pressure of gas in the tanks, & to the volume of the tanks. This is similar to an electric vehicle, with compressed air tanks substituted for storage batteries.

Compressed air storage is worth considering becuz pressure tanks are very simple, have no moving parts, won't wear out, & shd last the life of the vehicle. By contrast, lead-acid batteries have to be replaced every 2 or 3 yrs & are quite expensive. Pressure tanks might be cheaper than batteries, especially if you can buy used ones. Used tanks shd be perfectly sound, as long as they are not corroded, whereas used batteries are generally worthless, becuz batteries deteriorate fatally while in use. And air tanks cd be recharged quickly, depending only on the capacity of your compressor. Discharged batteries must be recharged slowly (overnite) to avoid damage. The main disadvantage is that compressed air tanks may not have as high an energy density as batteries, i.e. they may not hold as many units of energy per unit of weight or per unit of volume.

ENERGY DENSITY

For more on compressed air energy storage see pp [illegible] & [illegible] of LIVING FREE #[illegible]. There [illegible] gives the formula for energy stored in a compressed air tank as:

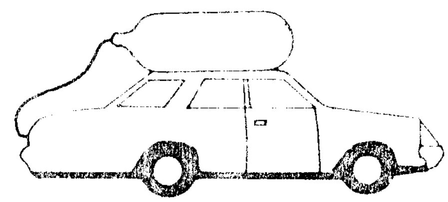
$$\frac{V \times P}{[illegible]}$$

where: [illegible] = energy in kilowatt-hours

V = volume in gallons

[illegible] = pressure in psi.

A standard propane tank is rated at 600 psi he says. Let's say we use that kind of a tank in a vehicle. We'll [illegible] our vehicle's motor operates at [illegible] psi. [illegible] that



the air tank will provide [illegible] of power to drive the motor until the pressure falls to 150 psi. [illegible] formula [illegible] we have [illegible] operating [illegible] with 150, [illegible]:

[illegible]

[illegible] tank. Then:

$$[illegible] = \frac{[illegible]}{1[illegible]} = \frac{[illegible]}{1[illegible]4} = 1.6[illegible] KWH$$

And since [illegible] 1000 watts, this is equivalent to 1[illegible] watt-hrs. So we can store 16[illegible] watt-hrs in that tank [illegible] in [illegible] way.

The inside volume of the tank is [illegible] gal, so the energy density per unit of volume (Edv) is:

$$Edv = \frac{1[illegible] \text{ w-h}}{[illegible]} = [illegible] \text{ watt-hrs/gal.}$$

To find the energy density per unit of weight (Edw), we have to know the wt of the tank & the wt of the air compressed inside it.

Wt of air: [illegible] psi is about 41 times the pressure of air at sea level (14.7 psi), we have to pump 41, [illegible] gal volumes of air into the tank to bring it up to 600 psi. Air weighs 0.01[illegible] lbs/gal (at 14.7 psi pressure, 32°F temp). So the air in this tank at 600 psi weighs:

wt of air = 41 x [illegible] gal x .01[illegible] lbs/gal = [illegible] lbs

FROM LIVING FREE ($1.00) BOX 29 (HILER) KENMORE N.Y. 14223

United States Patent

VALVE MECHANISM FOR AN AIR OPERATED RECIPROCATING ENGINE

Inventor: Robert T. Manor, Box 95, Salmonia, Ind. 47381

FIG. 5 is a diagrammatic view taken from the rear of the vehicle of FIG. 1 showing the reciprocating piston engine in perspective and rotated 90° from its normal position;

FIG. 6 is a fragmentary front view of the vehicle of FIG. 1 showing the position of one of the air tanks;

FIG. 7 is a diagrammatic perspective view of the compressor system mounted in the front end of the vehicle;

FIG. 8 is a perspective of the electrical power cord housing and retriever;

FIG. 9 is a fragmentary rear view of the vehicle with the body removed;

FIG. 10 is a longitudinal sectional view of the suspension type compressor;

FIGS. 11A and 11B are cross-sections of different parts of the engine valve mechanism in position for forward operation;

FIGS. 12A and 12B are similar cross-sections but with the parts shown in position for reverse operation of the engine;

FIGS. 13A and 13B are top and side views, respectively, of the valve mechanism;

FIG. 13C is a side view of the spool valve used in the mechanism of the preceding figure;

FIG. 13D is a side view of the sleeve valve used in the valve mechanism; and

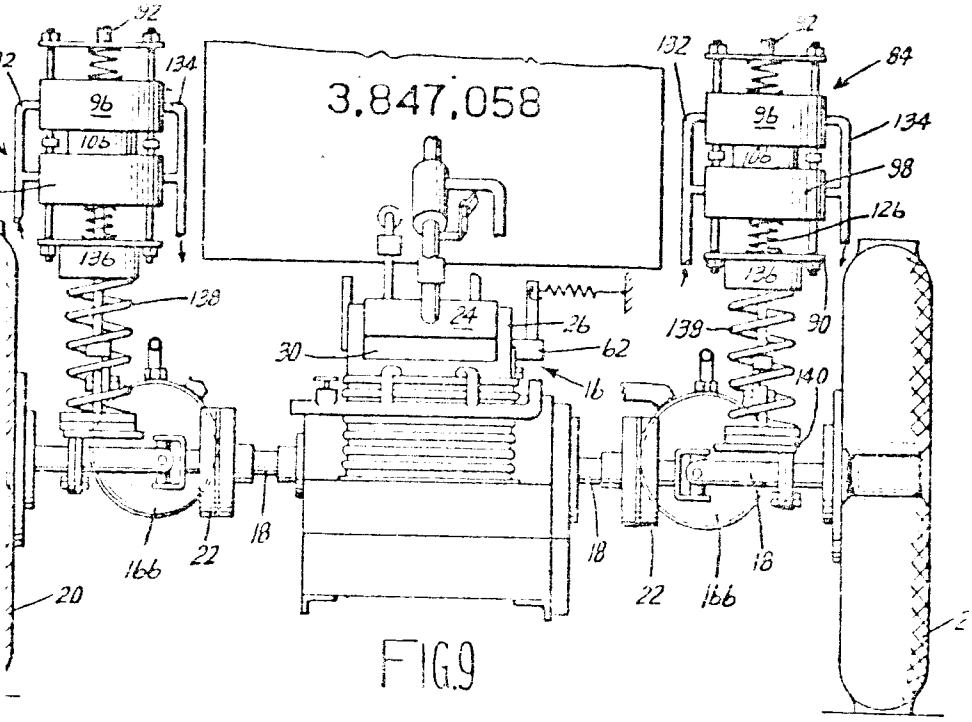


FIG. 9

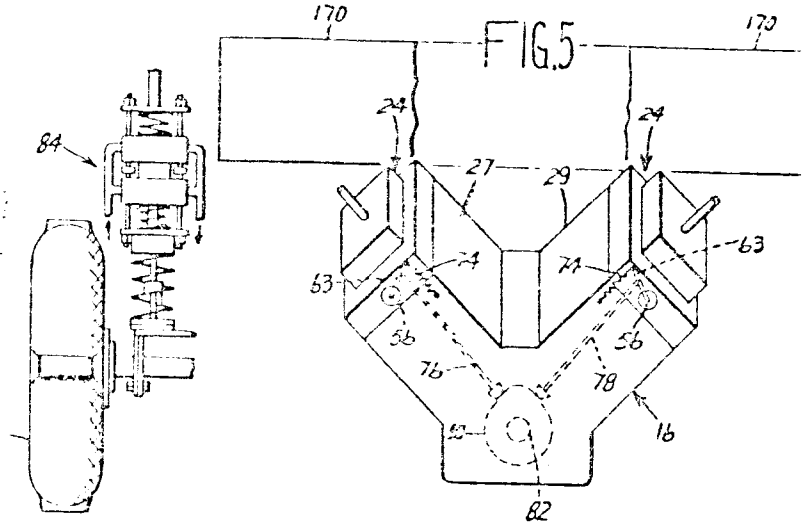


FIG. 5

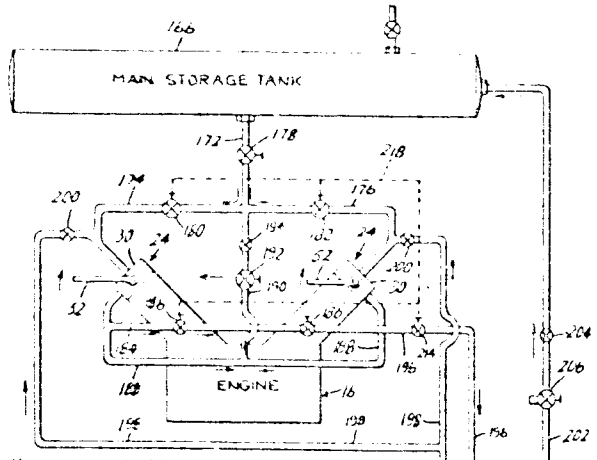


FIG. 4 is a diagrammatic illustration of the fluid pressure system used in the vehicle of FIG. 1;

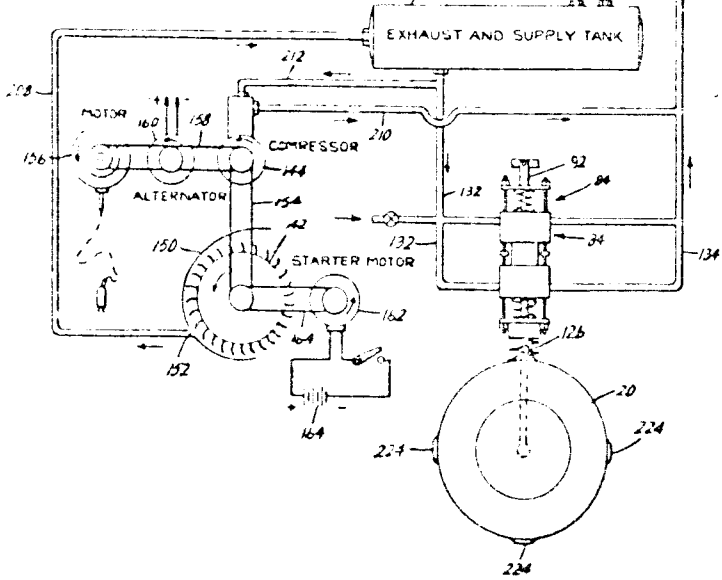
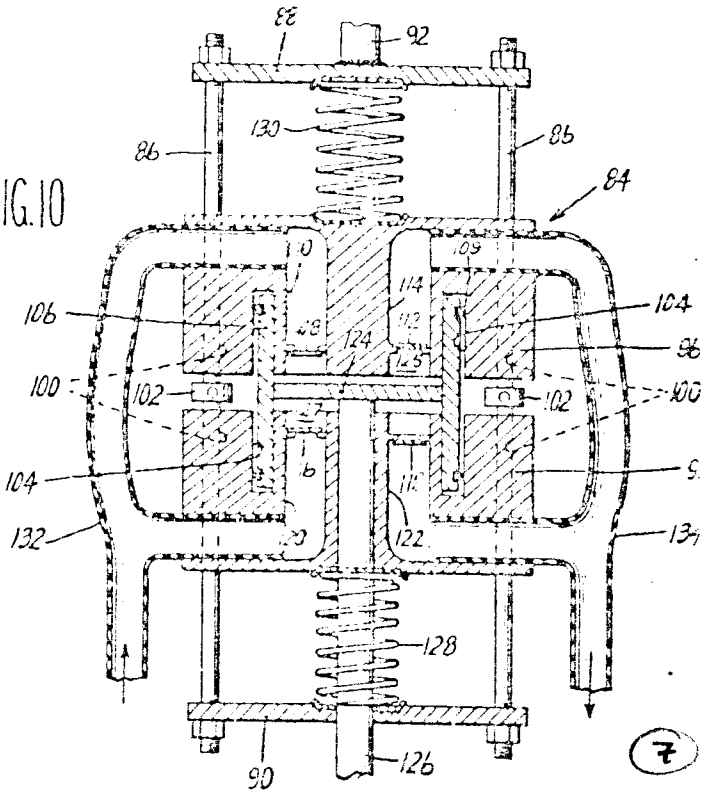


FIG. 10

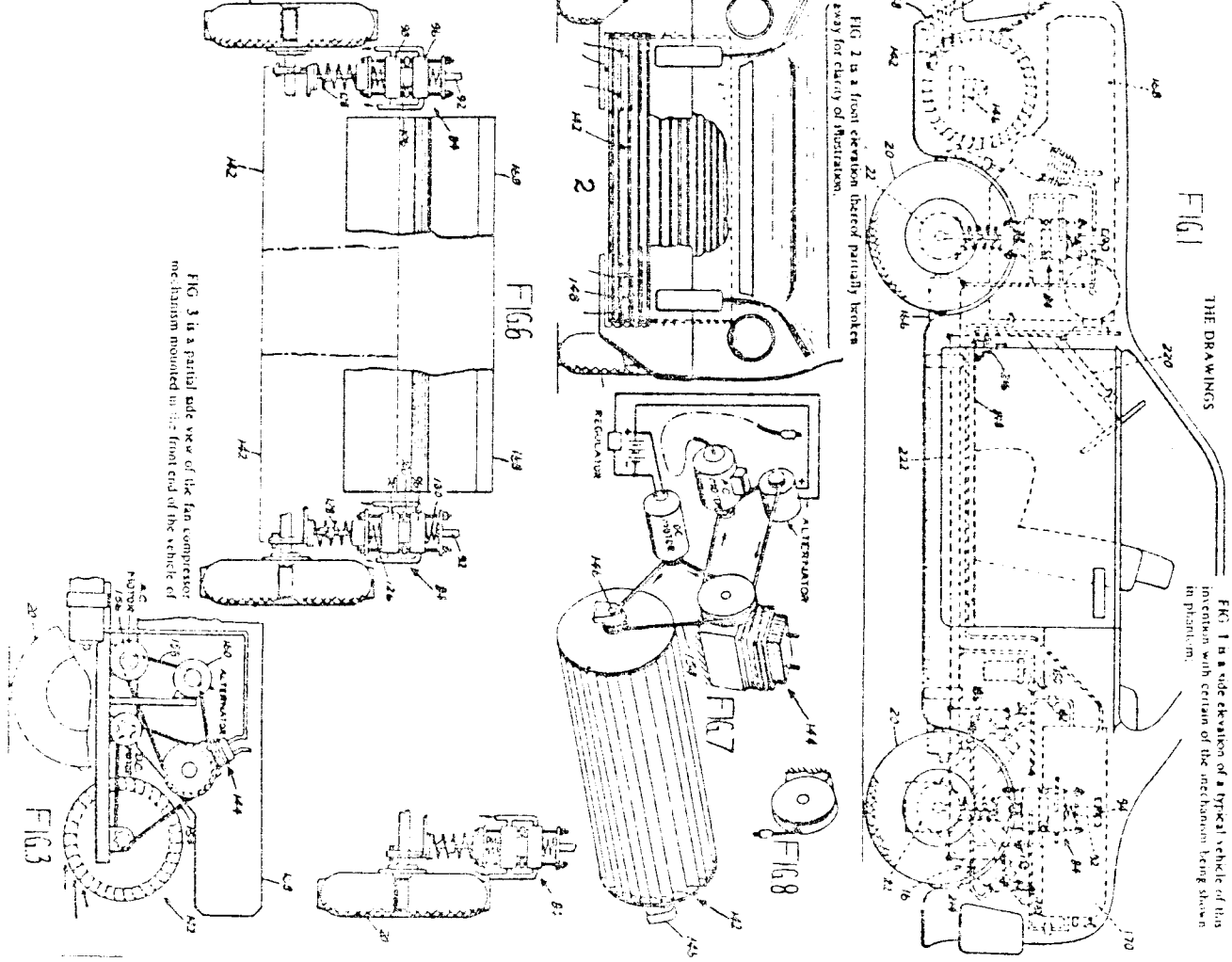


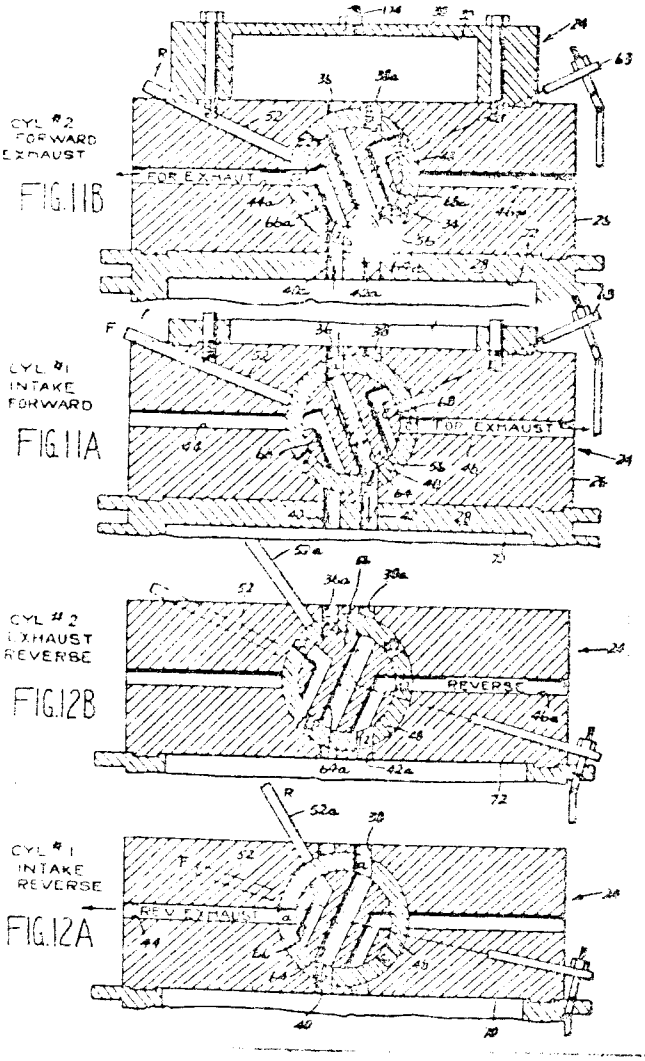
THE DRAWINGS

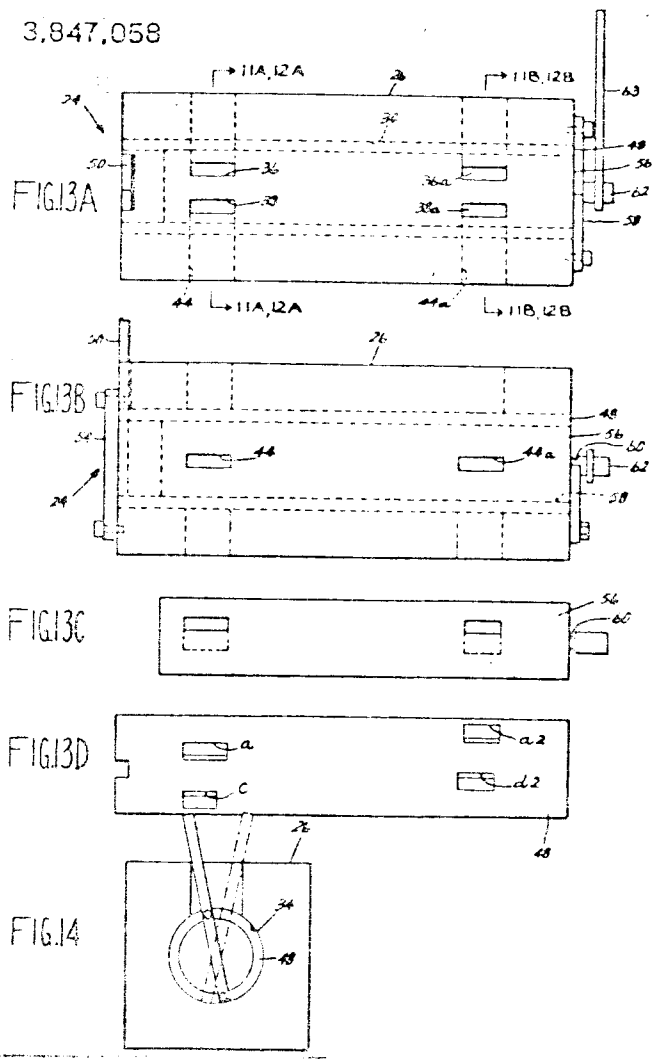
FIG. 1 is a side elevation of a typical vehicle of this invention with certain of the mechanism being shown in phantom.

FIG. 2 is a front elevation thereof partially broken away for clarity of illustration.

FIG. 3 is a partial side view of the fan compressor mechanism mounted in the front end of the vehicle of







VALVE MECHANISM FOR AN AIR OPERATED RECIPROCATING ENGINE

[22] Filed: Mar. 14, 1973
[21] Appl. No.: 341,318

3,847,058

[52] U.S. Cl. 91/413, 91/467, 137/596
[51] Int. Cl. F15b 11/00
[58] Field of Search 91/467, 413; 137/596

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Primary Examiner—Edgar W. Geoghegan
Assistant Examiner—William F. Woods
Attorney, Agent, or Firm—Gust & Irish

[57] ABSTRACT

For use in an air operated, reciprocating engine, a valve mechanism for controlling mode of engine operation as either a prime mover or compressor as well as direction of operation. The valve mechanism includes a spool valve rotatably mounted inside a sleeve valve, both having a plurality of passages alternatively registerable for determining mode of operation. The sleeve valve is rotatably mounted in a head block having registerable passages communicating with the pistons.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates generally to vehicles and more particularly to a vehicle that operates from gaseous fluid such as air under pressure. More specifically various means are provided for generating air pressure from the various motions of the vehicle, both forward and vertical.

SUMMARY OF THE INVENTION

In accordance with the broader aspects of this invention there is provided an air powered vehicle having a chassis and wheels. An air powered engine having intake and exhaust systems is mounted on the chassis and has a driving connection with the wheels. A first reservoir of gaseous fluid under pressure is connected to the intake system for operating the engine. Means are provided for regulating the flow of the fluid to the intake system for controlling the operation of the engine.

A second reservoir is connected to the exhaust system for receiving spent air, conduit means being connected between the second reservoir and the intake system. This conduit means is provided with a check valve which limits the flow of air in only the direction from aid second reservoir to said intake system.

A suspension-type compressor is operatively connected between a wheel and the chassis, whereby relative vertical motion between the wheel and the chassis will cause operation of the compressor. This compressor is provided with inlet and exhaust ports connected, respectively, to said second and first reservoirs, whereby operation of the compressor pumps air from the second reservoir to the first reservoir.

Means are provided for disconnecting the flow of fluid from the first reservoir to the intake system and connecting the exhaust system to the first reservoir whereby the engine may serve as a compressor for delivering air under pressure to the first reservoir.

Further means for supplying air under pressure to the first reservoir includes a fan type compressor mounted on the front portion of the chassis. This fan type compressor is exposed forwardly to be operated by the air flow induced by forward motion of the vehicle. A conduit connects this fan compressor to the second reservoir for delivering air under pressure thereto. A reciprocating piston type compressor mounted on the chassis and having a driving connection with the fan compressor has conduit means coupled to the first reservoir whereby operation of the fan compressor serves to operate the piston compressor for delivering air under pressure to the first reservoir.

As sub-combinations of the generic invention are (1) a valve mechanism for selectively admitting and exhausting pressure fluid from the chambers of the reciprocating piston engine and (2) a suspension type compressor which may be connected between the vehicle chassis and the axle which serves to provide air under pressure as a consequence of the relative vertical motion between the chassis and the axle or wheels.

It is an object of this invention to provide an air powered vehicle in which pressure air is generated from the forward and vertical movements of the vehicle.

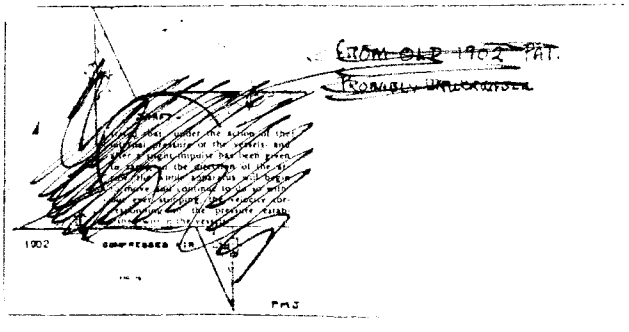
Another object of this invention is to provide in an air powered vehicle a reciprocating piston engine which may be operated as a compressor, a suspension type compressor which provides compressed air as a consequence of the relative vertical motion between the vehicle chassis and the wheels, a fan type compressor that operates from the air flow induced by the forward motion of the vehicle and lastly a reciprocating piston compressor which is operated by the fan compressor for providing further compressed air.

Another object of this invention is to provide a valve mechanism for an air powered engine of the reciprocating piston type.

Still another object of this invention is to provide a suspension type compressor capable of generating air under pressure due to the relative vertical motion of the vehicle suspension system.

Still another object of this invention is to provide a fan type compressor which not only serves to generate air pressure itself but also to drive a reciprocating piston type compressor which generates air under pressure for use by the air powered engine.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings.



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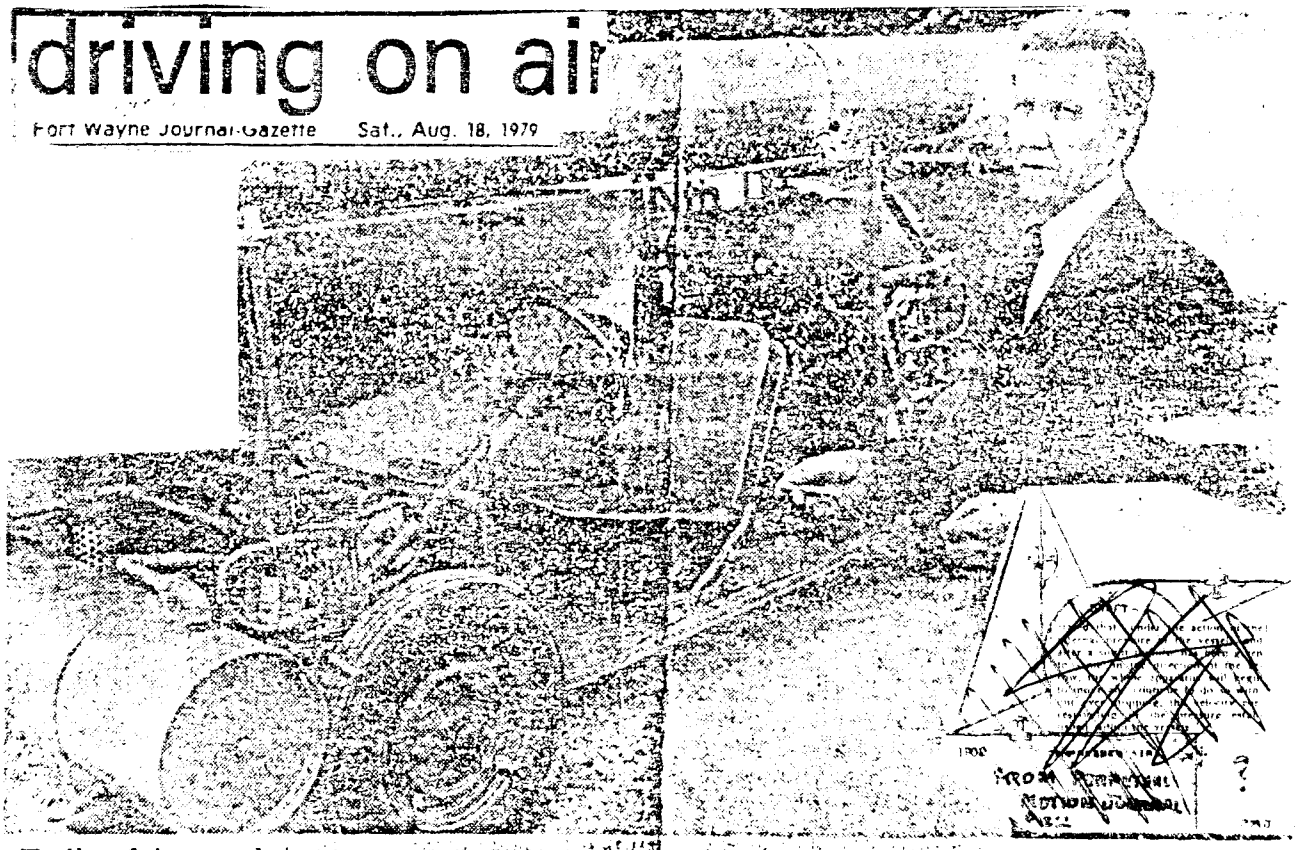
driving on air

Fort Wayne Journal-Gazette Sat., Aug. 18, 1979



Full of hot air

Robert T. Manor, a Jay County monument dealer and backyard inventor, has spent the last 11 years tinkering away at an air-fueled automobile. His brainchild has come to a patented fruition, and Manor is looking for potential backers. — Staff photo by Sherman Goldenberg

By SHERMAN GOLDENBERG
Staff Writer

SALAMONIA — Robert T. Manor has invented something so logical, so obvious, it's almost embarassing.

Believe it or not, this Jay County monument dealer and backyard inventor has spent the last eleven years perfecting and patenting an automobile that runs on air. That's right. On air. It's just as simple — or as complicated — as that.

"The reason I started on it was pollution," Manor said Friday, standing in his garage. "The energy crisis wasn't even heard of when I started. At that time, the late 1960s, I went up to Syracuse, N.Y., to see my sister. And though the people there didn't seem to notice the pollution, I certainly did. My eyes watered. My nose burned. I thought it was awful."

So Manor, who never graduated from high school, went to work on an idea he had nurtured since the 1940s when he worked with air compressors on a sandblasting job: Use a small electric motor to fill compressed air tanks. Patent an engine with pistons that will respond to a direct blast of air, much like a steam engine's. Then devise a collector system to capture the spent air and return it to the storage tanks to complete the cycle.

And — voila — you have the potential power cheaply and cleanly whole fleets of buses and millions of gas-guzzling automobiles.

If he had had all the money in the world, Manor said, he would have carved a scale model and performed more experiments beforehand. His prototype would have look more polished, and probably would have incorporated a tubular steel frame instead of an old Volkswagen body. But, he says, the funds were limited. His version cost about $30,000, not counting years of labor.

Therefore, this 54-year-old inventor sounds almost apologetic when he shows you his amazing car, a genuine contraption that looks and sounds like an inspiration of cartoonist Rube Goldberg. "This is just the basic idea," said Manor, pointing out flaws. "I didn't design it for speed or endurance. I just designed it to power a car. That was all of it."

But while the car may be crude by General Motors standards, said Manor, it is undoubtedly the only machine like it in existence.

Two 105-gallon air tanks are mounted on the roof and filled to a pressure of about 120 pounds, close to that of a truck tire. Pressure is infused with an electric motor powered by current from a wall socket. By pushing a lever between the front seats, the driver sends air into the converted four-cycle, gasoline engine and sets the auto in motion. As it moves along with a rhythm, the used air is piped in to three smaller exhaust tanks welded to the front and back.

Manor has a total of 17 patents on his engine and unique compressors. These double-action, spring-like compressors, stationed where the shock absorbers would normally be, are designed to return a small amount of compressed air to the storage tanks every time the wheels bounce across the pavement. About 10 per cent of the total air volume is lost to friction in each cycle. And, eventually, the storage tanks must be re-energized with the electric motor.

But this is just the prototype, warns Manor, adding that the next model will utilize a combustion engine that automatically re-energizes the storage tanks when the pressure drops. He expects the new air-powered vehicle, an old Ford van, to go 60 miles per hour with the range improved from two to 1,000 miles. The repumping process, he maintains, will require about a gallon of gas for every 85 miles on the road.

Manor says he would eventually like to see his idea perfected by engineers with a solid financial backing. He has contacted several major corporations, along with President Carter, without any positive response as yet. Manor, however, said he won't put his family's livelihood on the line trying to sell his ideas. He said he's heard of too many inventors who made "fools of themselves" that way.

Having come this far without a federal grant, Manor's prepared to go it alone or with a small team of private investors. After all, he explained, money was never his main objective.

"Money is not my main interest in it," he said. "It seems to me we've done a pretty bad job in the last 20 years as far as making a future for our children and grandchildren. And with atomic energy ... we may end up with no future generation at all. So, I thought, why not make a vehicle that doesn't pollute? You're certainly not going to destroy the world with it."

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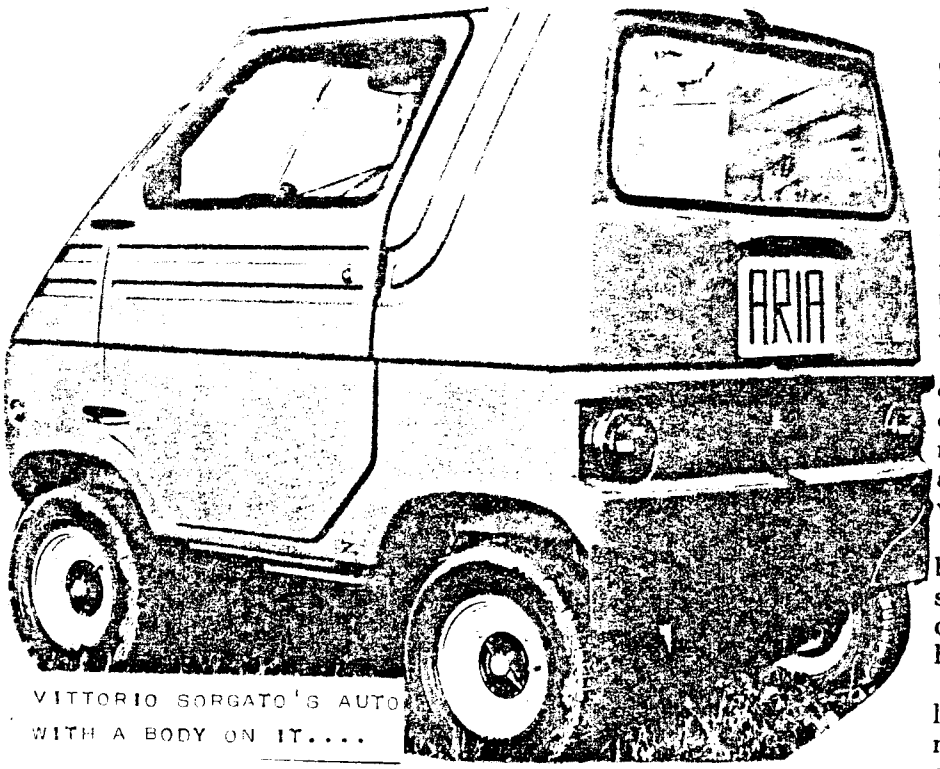
Air-Powered Autos Possible Right Now



VITTORIO SORGATO'S AUTO WITH A BODY ON IT....

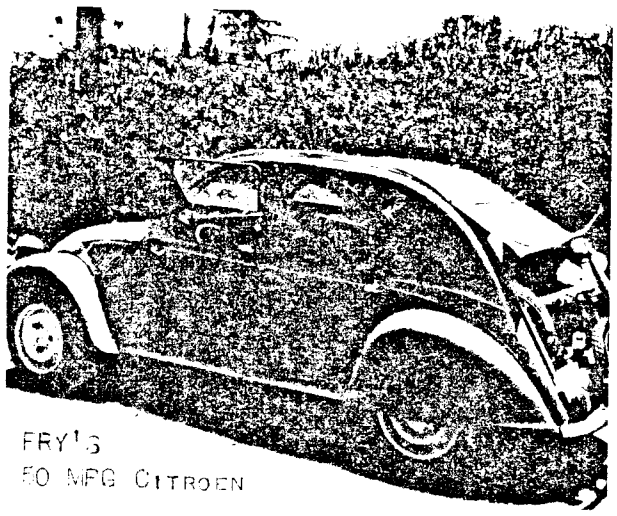
One that was reported to have been quite successful, nevertheless, was the car built back in 1931 by a Los Angeles engineer named Roy J. Meyers. It was driven by an engine of radial (aircraft type) design, with six cylinders. Having an extremely high power-to-weight ratio, like all air motors, the Meyers engine produced over 180 horsepower while weighing only 114 pounds. News accounts of the day—perhaps over-optimistically—reported that the vehicle had a cruising range of several hundred miles if speeds were kept low.

Like steam and electric prime movers, air motors can be perfectly adapted to the unique demands of driving motorcars. Basically, this is because these motors have huge, indeed almost infinite, torque available at low shaft speeds. They need no power-wasting torque conversion (transmissions).

The air motors that would be used in an automobile would resemble a steam engine except that, since the air is not hot, they would avoid the lubricant breakdown that is one of the major technical hangups of steam engines.

In earlier years, air power simply employed a large pressure tank, a control valve and a reversible motor to twirl the wheels. There are still railroad engines from the turn of the century operating every day on this principle, in mines and areas where combustion exhausts are prohibited.

The most advanced—and efficient—air vehicles, however, would probably use liquid air to avoid the dangerous pressure vessel that could explode like a bomb in an accident. A warming device, probably operated from a battery, would heat the liquid air enough to vaporize it and build up the pressure that could drive the engine's pistons.

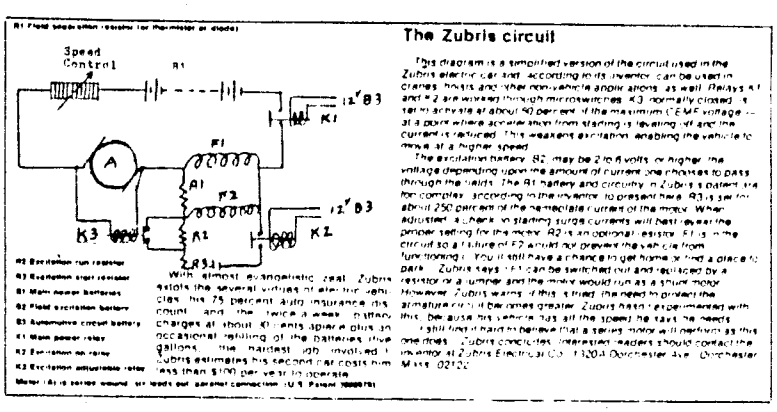


FRY'S FO MFG CITROEN

As with the electric car, there would be no pollution from an air-powered vehicle. A very slight oil vapor would be emitted in the exhausted air, but this could easily be removed by filtration.

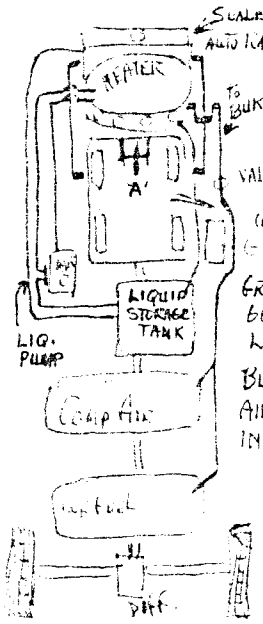
It is precisely the bigger cities that have become pollution terminal cases where by far the greatest proportion of vehicle miles are driven in the U.S. each year. Electric and air-powered cars could be put on the road right now that would immediately halt a sizable proportion of this air poisoning.

But whether such cars would be of much use for over-the-road driving is problematical. An electric car could conceivably take a trip across the country, although cruising range in any electric with a battery no larger that the "guts" of an ordinary gasoline car would, today, be quite limited—probably a maximum of 100 miles.



SPOTLIGHT, Dept. 133
300 Independence Ave., S.E.
Washington, D.C. 20003

PERRY MOBILE



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MODEL A FORD RODS & CRANK

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AIR PUMP GAINS POWER FROM DECELERATION
LIQ ST. TANK COLLECTS LIQ AS IT CONDENSES IN RADIATOR
NO FURTHER DATA FRY 65

Incredible car runs great on cheap compressed air

An amazing new car breezes along powered only by air! And inventor Terry Miller says his incredible machine is the ultimate answer to the energy crisis and pollution.

By STEVE PETRONE

The 47-year-old engineer from Crestline, Kans., built his air car to prove that an old idea's time has finally come.

"This isn't a new idea. The first designs for air-powered cars go back as early as 1894.

"But for the past 90 years development of the air car has not been feasible. Now, with gasoline prices as high as they are, it makes terrific sense," says Terry.

Terry's car runs on a compressed air system which he invented. Two compressed air cylinders send blasts of air to the rotary-shaped, eight-cylinder engine.

By the time the air reaches the exhaust system it's actually cleaner than when it left the cylinder!

The inventor says top cruising speed for the car is 48 miles an hour. And Terry is in the process of developing a system which will give the car a range of 45 miles. While Terry is not hoping to put any Detroit auto makers out of business, he thinks he's got the beginnings of an ideal in-town runabout.

"We've got electric cars beat by a long shot. You can't drive them all day — their batteries get weak and you have to stop and recharge them.

"But with our air car you can just pull up to a pump, fill the tanks with compressed air, and you're off again. And it's cheaper to run than an electric car," Terry said.

The only thing Terry's car lacks right now is glamour.

But he's quick to explain that he didn't build it to be beautiful — he built it to be practical.

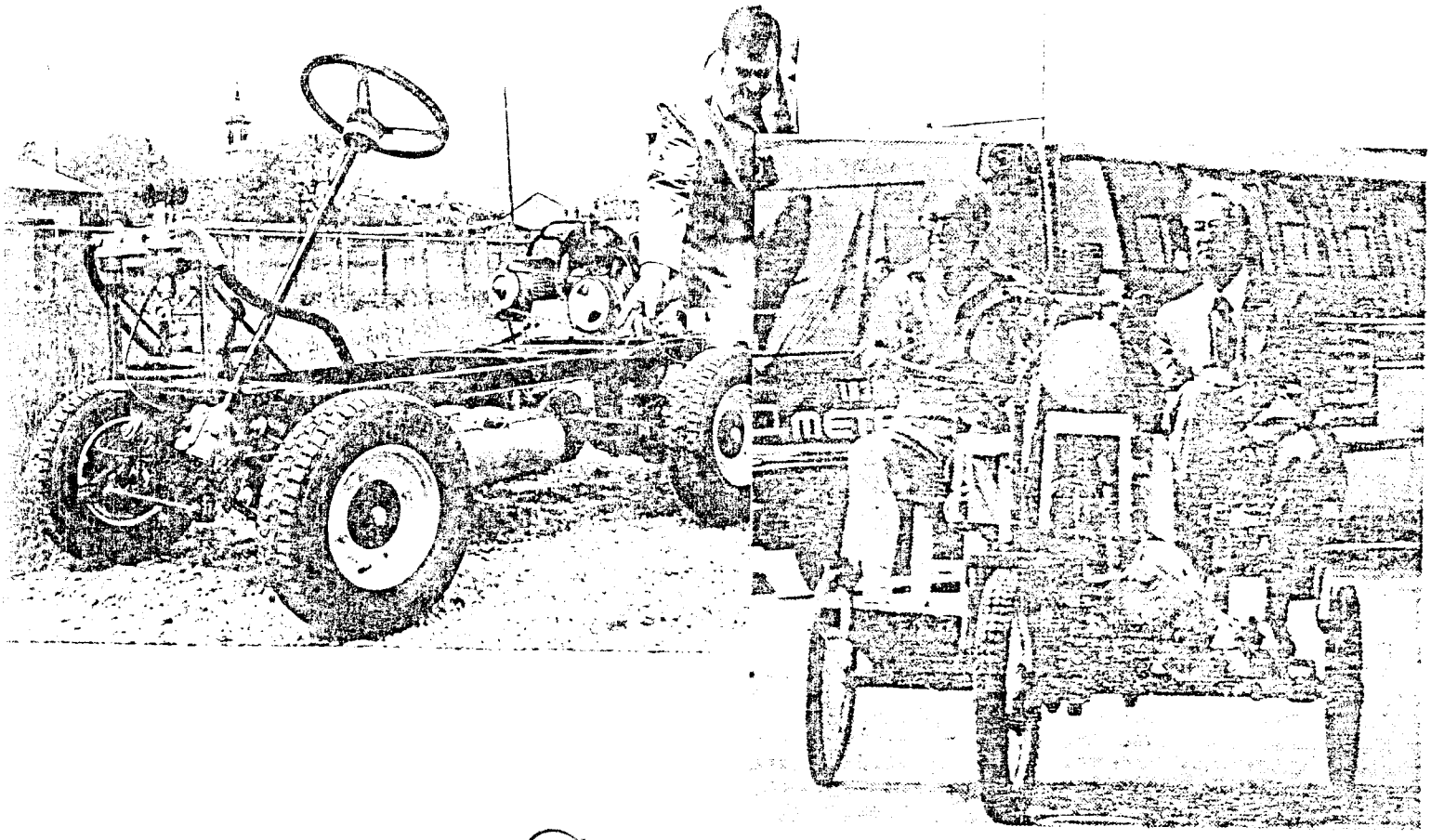
He's spent the better part of the last two years developing and refining the drive system. He says a better-looking body will be constructed around his engine eventually. But for now, he's satisfied to look like a traveling garage sale as he merrily tools down the road in his air car.

Aside from the air car's appearance, Terry's biggest stumbling block has been funds. He's applied for a $2 million federal government grant to continue development. And he just completed a cross-country tour to show his car to the public in an effort to gain support and publicity.

"It's so close right now, and the need is so great, that I'd hate to have to stop development because of money. But I've devoted two years to this car now, and I may have to go back to work soon."

WEEKLY WORLD NEWS, October 23, 19

HERE IS VITTORIO GORGATO'S AMAZING LITTLE COMPRESSED AIR AUTO NEAR MILAN ITALY (73)



Terry Miller, left, takes a passenger along for a demonstration ride in his incredible air-powered automobile.

TERRY MILLER HAS A BREEZY REPLY TO THOSE O.P.E.C. BLOWHARDS: AN EFFICIENT AIR-POWERED CAR

"We have satisfied ourselves we are not whistling in the dark," says Terry Miller, 47, of Crestline, Kans. Nor, he might add, is he full of hot air, though his invention, a pollution-free automobile, is.

Air-powered vehicles are nothing new. One of the earliest patents was issued in 1885 to Charles E. Buell of Springfield, Mass. But Miller, who has put $15,000 and most of the last three years in the project, has built a soon-to-be-patented sequential arrangement in which compressed air is passed from cylinder to cylinder, something like a bucket brigade, to turn an axle. The compressed air's power is thus exhausted through four cylinders, rather than escaping after only one as it did in previous inventions.

Miller's prototype, a three-wheeled, 1,400-pound vehicle, can travel up to 32 mph and has a range of some 17 miles (the consumer version will go 45 miles). He can refuel the compressed-air containers in four minutes, using a windmill, at an overall cost of less than a cent a mile.

Miller, fascinated with engines since childhood, graduated from the Spartan School of Aeronautics in Tulsa. He's licensed as a pilot and an aircraft mechanic instructor. While he was developing his air-powered car, Miller and his second wife, Sharon, made their living by customizing campers.

Currently he is demonstrating the car full-time at state fairs and energy exhibits, although he has not entered it in the $25,000 Los Angeles-to-Rochester, N.Y. rally in September for new alternative-fuel cars. Alcohol cars and salad-oil cars will be among those competing for that prize.

Mass-produced, Miller's car would sell for about $4,000, he estimates, including his modest royalty of about $10 per vehicle. Meanwhile he sells design-and-building instructions for $2. After five Buffalo, Okla. high school students used them to build their own air car, they applied to drive it at Ronald Reagan's inauguration. Their rejection letter arrived the day after the parade.

But the air car is not a toy, Miller insists. "It's a weapon that can be used," he says. "It allows us to think about wind energy as a viable alternative to petroleum products." □

Terry Miller tools down Highway K-26 in Crestline, Kans. in his air-powered prototype. His planned consumer version would carry one passenger plus the driver.

Photograph by Michael Salas

USP 3,745,887 (Cl. 92-146.000)

Cam-action air motor develops full torque at rest

By DAVID SCOTT

A novel air motor, developed by Canadian inventor George Striegl of Prescott, Ont., is entering the marketplace as a plastic, piece-together educational toy for children. But Striegl has more serious applications in mind. The clever motor has pistons but no crankshaft; it develops full torque at rest (like a steam engine), eliminating the gearbox; and it's also nonpolluting and virtually noiseless.

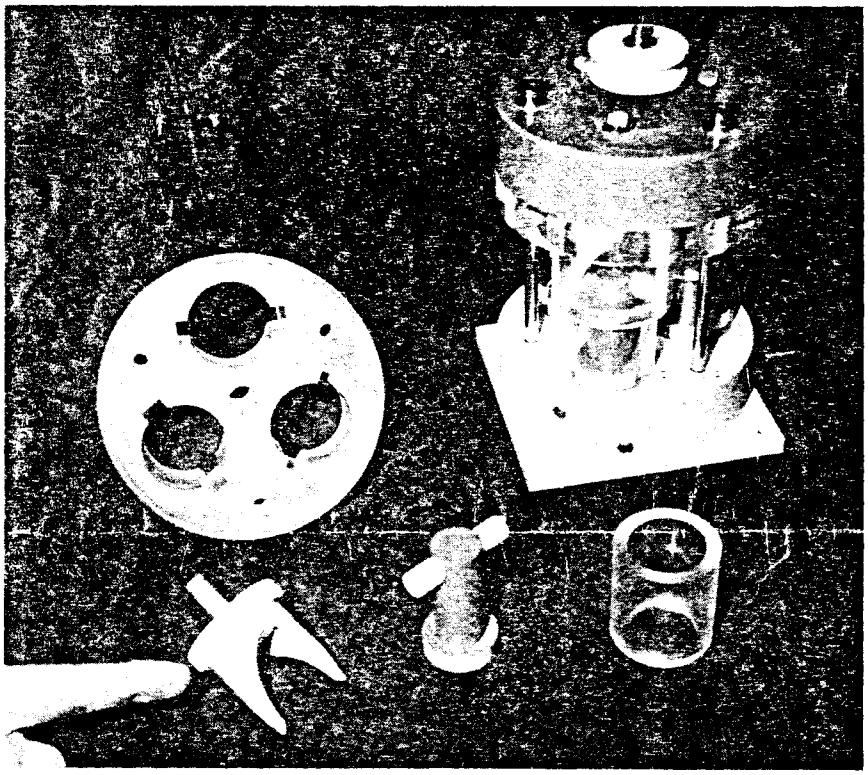
These advantages, says Striegl, make it ideal for powering indoor vehicles at airports, railroad stations, and hospitals. The range would be short, but refilling the onboard air bottles at convenient points around the building would take only seconds. (Recharging batteries for electric cars can take hours—and batteries are much heavier.) The motor would also be a natural in mines, because no potentially explosive fuel is used.

The toy version, made by Tempo Contact Ltd. (Box 40, Spencerville, Ont. KOE 1XO, Canada), is a vertical model, with three cylinders equally spaced around a central output shaft. The diagram (which is of a two-cylinder rather than a three-cylinder motor) shows how it works. In the three-cylinder model, of course, the cylinders are phased 120° apart (rather than 180° as shown in the diagram), and cycle with successive power strokes. Air inlet and exhaust are controlled by individual spool valves in the base of the motor. The valves are operated by cams at the bottom of the central shaft. Valve timing is set so compressed air is injected only during the first third of each piston's upward stroke.

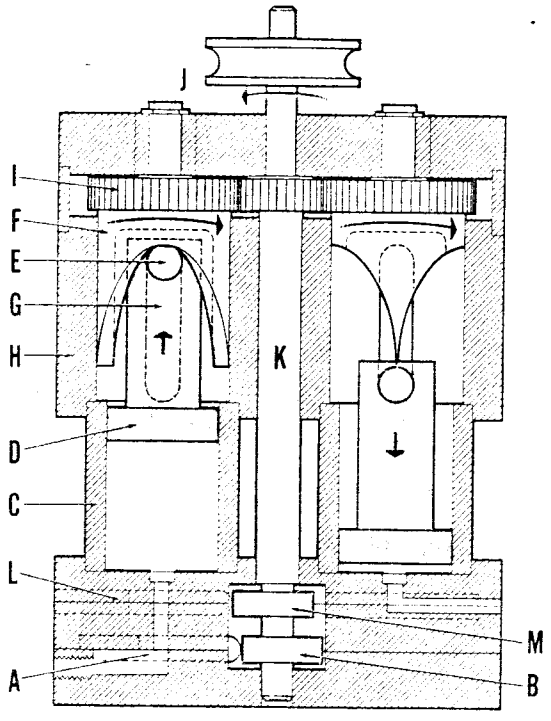
After the air is shut off and the piston reaches the top of its stroke, the inner rollers sweep over the troughs of the rotor's forked cams. With continuing rotation of the gears, the reverse cam profiles force the rollers and hence the piston down, and the exhaust valve opens to release the air. The rollers then ride over the cam peaks, and the cycle repeats.

The motor is a slow runner, with 1000 rpm about its maximum. Efficiency is claimed to be very high, around 80 percent.

The kid's version is made entirely of plastic moldings, and can be run by a bicycle pump. Power is very low, so there's no danger to probing fingers. The first industrial project will be an eight-cylinder opposed-piston unit developing 30 hp with air at 88 p.s.i. PS



Main components of one cylinder include two-pronged rotor with integral gear (front left), piston (center), and cylinder (right). Upper-cylinder block and assembled motor are behind.



Compressed air from inlet valve (A) operated by cam (B) is released into working cylinder (C). Piston (D) with fixed upright rod thrusts up, and inner roller (E) bears against arch-shaped cam of rotor (F), making it rotate. Outer rollers on piston rod run in vertical guide slots (G) in upper cylinder (H), preventing piston from turning as it reciprocates. Gear (I), integral with rotor, drives central pinion (J) on output shaft (K). On downstroke, air exhausts through valve (L) operated by cam (M).

15

Auto runs on air update:

Inventor ponders coast-to-coast trip with Air/Auto

By GILBERT LAWRENCE

Lee Rogers is quickly learning that the way of an inventor is saturated with temptations, ridicule and extreme financial hardships.

Mr. Rogers is the inventor of an air powered automobile. On April 15 the Consumers Guide published an exclusive article about this innovative hard-working 41 year old former home builder.

Since then, this writer in the company of Duane Pheils, made a 2,000 mile round trip to obtain an interview with Lee Rogers and his wife Betty Jean, at their home located in Iona, Florida.

Two extremely sour eyed Dobermans saw us through the door and inside, we found the slender affable Mr. Rogers and the (at first) somewhat reticent Mrs. Rogers awaiting our arrival.

As we conversed, their strange — but inspiring — story unfolded. "Two years ago," Mr. Rogers told us, "we, the family, went on a vacation in our motor home. The cost of fuel was astronomical and I said in jest 'When I get back home, I'm going to invent a car that runs on air!' Of course we had a good laugh over such a ridiculous idea."

Mr. Rogers paused a minute to wipe clean his spectacles before continuing. "But, somehow, the idea wouldn't leave me. Maybe it became almost an obsession. Anyhow, within a few days I was thinking deeper on the subject and even drawing rough sketches and mentally probing the theory."

Prior to the idea of the air-car Mr. Rogers had been a successful home building contractor where he earned a high monthly income. It was quite evident that he was more than a little

LEE ROGERS

conceal his pride when he recalled, "One time I had to complete a home for a doctor in 90 days. Problems plagued me from the beginning. My son and I did the job practically, and managed to complete it within the 90 days allotted. The doctor was pleased and I really felt deep satisfaction."

The foregoing is illustrative, I think, of the kind of a man Lee Rogers is. He is stubborn, industrious, hard working and, although he can claim no degrees in higher learning, he is driven by good common sense and dedication to seeing things through to a successful conclusion.

He is in good company here I mentioned as I was unable to recall the

degrees boasted by Henry Ford, the Wright Brothers, Thomas Edison and countless others. There was no comment from Mr. Rogers, though.

Later, seated around their dining room table we learned many things we hadn't realized before, namely, the sacrifices that this family has made to create an air powered engine that surely will revolutionize industry and the life style of the entire world.

Gone is the motor home of which they had spoken so fondly as are the dune buggies they once enjoyed. As a matter of fact one came away with the realization that the entire family's energy and direction has gone into the evolution of this concept. As a result, many of the niceties we take for granted have been forsaken by them.

The entire life style of this tightly knit supportive family has thus been altered by the money devouring dream of the head of the household.

While it is amazing enough that they have not complained, it is almost unbelievable when it is realized that they have turned down over a billion dollars, more than once, for the invention, as Mr. Rogers claims.

Before I ask why, Mr. Rogers exclaimed, "But that is O.K. with all of us because we not only want to do something for ourselves, but we want to do it for everybody in this nation!"

And he means it. So does Betty Jean. Frequently, throughout our long exclusive interview, both of them spoke of the outrageous oil prices which, "Border on pure blackmail!"

They are painfully aware of the dying American economy, the balance of trade deficits, and the general turmoil which they believe are all manifestations of our dependent economy.

"This country just can't continue to pay the always escalating costs of maintain the status-quo. "That wasn't our dream and it isn't," Mr. Rogers said flatly.

There is help expected in the near future, however. It will be in the form of a grant from the State of Florida. This grant does incidently, have the personal support of the Governor of the state, Reuben Askew.

One of Mr. Rogers' personal attorneys is Representative Paul Knuckels, who is also Chairman of the House Agricultural Committee of the Florida State Legislature.

Evidently, these two highly placed officials of the state are convinced that Lee Rogers, indeed, has developed a feasible engine which will operate at more than 95% efficiency and is just a hair's breadth away from true perpetual motion.

The proposed Florida grant is to allow Mr. Rogers the funds to refine the engine so that it will propel any size automobile, and be adaptable for use on older automobiles. The idea is to have the final product available in "kit" form.

"Right now," declared Mr. Rogers, "farmers could be plowing their fields in air powered tractors!" In fact, according to Mr. Rogers, "They would already be doing just that if I was not so cautious in having everything, perfect with respect to design and legal ramifications."

According to Mr. Rogers the farmer will first have the engine made available to them before anyone else. "My God!" he exclaimed, "do you realize what the cost of fuel is doing to the farmer? It is getting so bad that they can barely afford to grow the American's food!"

Mr. Rogers is perfectly aware of the shock to the world's economy if great [illegible] is not exercised in gradually "feeding it" into industry of all kinds.

success [illegible] on this pursuit, he could not

EXCLUSIVE!

Ford purchase of air-car design alledged by Rogers

By Jerry Keefe

In an exclusive Consumers Guide interview, in Iona, Florida, inventor Lee Rogers alledged that Henry Ford II purchased patent rights to a previously designed "air/engine" and information was on record in Washington, D.C.

* * *

Mr. Rogers told the Guide that his wife had received a phone call from a former "Big Three" executive, who was now retired. The unidentified caller felt obliged to warn Lee Rogers not to sell his air car design to any of the automotive manufactures because he felt that they would never develop it and the idea would just get shelved. The mysterious caller went on to say, "I know, because Ford has already done just that!"

* * *

Lee Rogers, is the inventor of an auto engine that literally runs on air. The exclusive article appeared in the April 15 issue of the Consumers Guide and set off a storm of controversy from coast to coast. The phone call was indeed a blow to Mr. Rogers, who up until this moment assumed he had an exclusive patent on a revolutionary theory.

* * *

Lee Rogers alleged that the former executive was ready to back up his phone call with absolute proof. Knowing that Mr. Rogers would doubt his story, the caller went on to tell him the location and number of the "Air Engine" patent that Henry Ford II had purchased several years previously.

Rogers, obviously puzzled, asked aloud "why in the world would Henry Ford II purchase the patent rights from an inventor and then just sit on it?"

Mr. Rogers claims he quickly boarded a flight to Washington D.C. and that at the U.S. Patent Office, much to his dismay, there was in fact registered under the patent numbers given him by the retired auto executive, the previously described potent.

Inventor Rogers was quick to point out several differences between his air car design and that of the Ford ownership. The patented design purchased by Ford was for a 6-cylinder engine, using the two forward cylinders for the thrust for air. Whereas, the Rogers design (also patented) is adaptable for eight, six or four cylinder use and as Mr. Rogers stated, "Several major differences exist between my patent and that of Ford."

Oddley enough, of the Big 3, Ford Motor Company was the only auto maker that showed no concern when first hearing of the Lee Rogers revolutionary air/car design.

* * *

Presently, the Consumers Guide is working with the office of nationally syndicated columnist Jack Anderson, in a combined effort to determine the exact facts.

If indeed, the Rogers allegations are collaborated and the U.S. Patent Office records prove a registered patent for an air engines design was purchased in excess of one million dollars by Henry Ford II, many questions regarding the air engine will need to be answered.

* * *

Ford's answer:

The Guide contacted the Ford Motor

Continued on page 8

[illegible] energy," Mr. Rogers explained. "We just don't have it!"

And this is why Mr. Rogers and his family have refused all offers to date for the rights to this revolutionary engine. They are convinced that if they do sell it, it will end right there' that selfish interests will "shelve" the invention to

trip to California and back in an air powered automobile. This, he feels, will convince all skeptics, as to the viability of his design. In addition he hopes to call the American people's attention to the fact that there is, after all, "A promise in the future for them."

Finds air car far beyond expectations

BY TOM HOLLATZ

Air Car update!

I received a letter the other day from Lee Rogers of Ft. Myers, Fla. Rogers, you may remember, has invented a car that runs on air. Sounds crazy, right?

I thought so too until I interviewed Rogers in Ft. Myers Beach last March.

Rogers' letter dated Sept. 20, 1981, forwards a report on the air car as reviewed by Glynn Raymond Wiggins, who has a list of credentials as long as Hwy. 51. Wiggins lives in Hendersonville, Tenn., and recently stayed with Rogers, inspecting Rogers car, seeing if it is what Rogers claims– an air car running on nothing but air.

After Wiggins' review of the air car, Rogers wrote "we are proceeding and hopefully will be marketing my invention soon."

Wiggins in his report states that he visited Rogers in Ft. Myers, Fla., on June 11, 1981. He spent seven hours looking at Rogers' fantastic project in three stages – static observation, power observation and discussion/-analysis.

Wiggins writes: "My first contact with the air-powered engine was to see it mounted on a conventional Vega automobile equipped with a standard four-cylinder gasoline engine. I observed that all gasoline induction components had been removed and had been replaced by the air induction kit which Mr. Rogers developed.

"I was impressed by the absence of the cooling system (radiator, water pump, etc.). I took adequate time to explore the newly installed items, their necessary fittings and brackets, the compressed air source and exhaust system. The observation was accompanied by my questions, which Mr. Rogers answered to my complete satisfaction.

"My next level of concern was to observe the engine in operation. The engine was started with the automobile's own electric starter. Mr. Rogers operated the throttle (the valve on the compressed air tank) while I observed the engine's operation. I concentrated on engine temperature, vibration and noise level during the first run. The air supply lines to the cylinders were cool, the engine block appeared to be at room temperature and the exhaust was very cool.

"After a 3-5 minute run, the exhaust system was cool as a normally refrigerated item of 40 to 50 degrees F., and we were operating in a garage of about 85 to 90 degrees F. There was negligible vibration. However, with a straight exhaust, it had less noise than a lawnmower.

"We stopped the engine and restarted it four or five times within a 30 to 40-minute time span, as I continued to observe its operation and question Mr. Rogers. My final observation centered around the air intake and the exhaust. The engine has a tremendous and powerful exhaust and, of course, a huge volume of air intake. I was not able to overcome the exhaust pressure with my hand as I had done on many gasoline engines.

"After my live observation, Mr. Rogers and I discussed my impressions of the engine. I found it to be far beyond my expectations. I find it simple, powerful, quiet running and with low maintenance requirements. After considerable study, I detect no mechanical deficiencies or contradictions to the inventor's claims. Every component I have observed is completely feasible.

"I recommend its development without reservation."

The ramifications of Rogers' air-powered engine are vast. Air and not expensive fossil fuel is used. Rogers told the Times last March that he turned down over $1 billion from a representative of the three large U.S. automakers for his invention. He declined. One of the reasons he hasn't "sold out," he said, is because if he did so his invention may never be seen again.

Rogers hopes to market his own invention and sell air-car kits for around $1,000, he said. "I'd be letting too many people down if I went back on my word," Rogers said. Rogers, who is quite handy with gadgets and tools, developed the air-car process while tinkering. His wife didn't believe it until she saw him driving down the street in an air-powered car. It runs on air, he claims.

If all things are true in this amazing story, just think what it means for all Americans– and the world, too. Home generators that can provide free electricity is only the tip of the iceberg. Outboard motors, snowmobiles, airplanes– you name it– if it's powered by an engine, Rogers' development should work.

Times' readers wishing to write Rogers can do so at Post Office Box 3077, Ft. Myers Beach, Fla., 33931.

Ft. Myers is the former winter home of that great American genius Thomas A. Edison. It is ironic that Rogers, too, loves Ft. Myers. He told the Times that the future money his invention will bring doesn't phase him one bit. It will only mean more worries including body guards and body guards to watch the body guards.

That will come, but right now Rogers is working on final plans to market his invention.

Readers forum

In the Spotlight!

OBSESSED, COMPRESSED AND DEPRESSED. A Florida inventor has allegedly been offered a billion dollars by the big three automakers for absolute patent rights to an automobile engine which runs on compressed air. Lee Rogers of Iona converted his 1977 Dodge to run on compressed air only. He's obsessed with making the idea available to the general public, and depressed about the possibility of the automakers keeping the idea a secret should he sell it to them. He and his neighbor are planning to manufacture a conversion kit which will "fit any American car." Meanwhile, he is working in secret, has an unlisted phone number and doesn't receive visitors — on the advice of his attorney.

Reprinted from Spotlight, 5/20/80

How about car that runs on nothing but air?

By JOHN HUBBARD
Times Business Editor

Move over, Times reader Cliff Greenman.

Make way for another Belmont observer of things revolutionary on the automotive scene — Martin Torgerson, owner of Village Cleaners.

Remember, earlier this year, Cliff, when you told us how excited you were over a new process developed by a Southern California company for producing vehicular fuel from sunlight and water?

Well now, what would you say about a car that reportedly runs on nothing but air?

That's what Torgerson has stumbled onto, by reading the Lakeland Times, a weekly newspaper from his former Wisconsin hometown of Minocqua which he subscribes to by mail.

In a recent issue, the Minocqua paper — quoting liberally from still another newspaper in Florida — ran an article on this invention.

Here's the meat of it:

"Imagine getting 25 million miles to a tank of fuel that reportedly costs no more than the cost of putting air in the tires of your car.

"Incredible, right? Very few people believe it, but the father-in-law of a Minocqua motel owner has seen the car and reportedly driven in it at Fort Myers Beach, Fla. Clarence Roessler, the in-law of Don Nelson of Motel Minocqua, has seen an automobile engine that is powered by compressed air which has been patented by an inventor. Reportedly, the developer has been contacted by major automobile corporation officials who thus far have expressed unanimous disbelief in the idea, according to a story in the Fort Myers Beach Bulletin newspaper.

"Lee Rogers, 41, designed the engine in his head two years ago after being frustrated with $7,000 yearly gasoline bills generated by his Pennsylvania building firm. After moving to Florida, Rogers went to work on his engine when he couldn't find work.

"Rogers converted a 318-cubic-inch Chrysler engine in a 1975 Dodge Aspen station wagon. The motor is driven by compressed air, forcing the pistons up and down in the same manner as gasoline drives an internal combustion engine.

"According to the story in the Bulletin, once the engine is primed with compressed air it runs in a self-sustaining cycle.

"According to the Nelsons, '60 Minutes,' the popular CBS television show, has filmed Rogers and his engine.

"The idea is basically simple. The engine has been converted to house eight air hoses going into each of the eight cylinders from a distribution block which sits atop the engine block. The compressor sits forward of the distribution block and controls the volume of air being forced into the engine, which in turn controls the speed of the vehicle, according to the new paper report.

"The driver observes the pressure in the air tanks with the help of two gauges on the dashboard. The pressure of the air being forced through the engine also is watched.

"Here's the fun part! Rogers removed the gas tank, carburetor, fuel pump, spark plugs, points, condenser and the entire exhaust system from his car to accommodate his conversion unit. Just think — no gasoline fumes and no pollution. Cold air recycling through the engine can be used to air-condition the car.

"Rogers said he can guarantee the engine for 25 million hours, or 30 years.

"Maintenance? The only requirement is frequent oil changes, tire maintenance and regular brake checks. He also claims that rings and valves could last two to three times longer because there is nothing to foul them.

"'This could turn our country around,' Rogers said in the Bulletin story.

"Rogers' wife, Betty, admitted that she did not believe her husband until she and a neighbor rode in the car.

"'We didn't realize how important this is until we came back and sat down and realized we had ridden in a car that wasn't using gas,' she said. The toughest part of their discovery, she added, has been convincing people that it really works.

"Rogers has patented both the engine in the station wagon and another whole engine and transmission to protect himself.

Rogers, the story went on, claimed that production of the conversion kits could produce about 3,000 units a day and be available to the public at $800 to $1,000 apiece. . . .

"Rogers said that if he doesn't get support, he will market the idea himself. Nelson said Rogers wants to help the working man in his constant fight against soaring gas prices . . . 'I hope he doesn't sell out to some car firm which just might put the idea on a back shelf; I don't think he will,' Nelson added. . . ." OK, Cliff Greenman, that's the story.

What does it blow down to?

Is all this air news cause for a new wave of excitement on your part, not to mention the rest of us pump price plagued gasoline users?

Or maybe just hot air?

Big stock buy-back

Cooper Laboratories, Palo Alto, says more than 5.9 million shares of its common stock were tendered to it as a result of the company's recent offer.

Of that total, Cooper said 1.5 million shares were accepted.

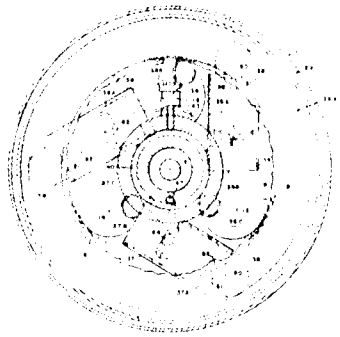
The company bought about 18,000 odd-lot shares first, then purchased some 78 percent of the remaining shares tendered on a prorated basis.

Before that action, Cooper had approximately 5.7 million shares outstanding.

The company develops and produces drugs, diagnostics and devices used primarily in specialty medical and dental practices.

2,982,261
AIR ENGINE
Cleo L. McClintock, Portland, Oreg., assignor to Edward M. Nelson, Colton, Oreg.
Filed July 7, 1958, Ser. No. 746,757
1 Claim. (Cl. 121—58)

An engine comprising a stationary cylindrical main housing closed at both of its ends by end walls, an engine shaft rotatably mounted within and extending to the exterior of the housing, a rotatable cylindrical housing disposed within the main housing concentric with the engine shaft and closed at both of its ends by end walls, and provided with an intermediate wall, one of said last mentioned end walls comprising a planet carrier, a plurality of planet gears rotatably attached to the planet carrier by their shafts extending therethrough, a sleeve rotatable about said engine shaft extending to the interior of said housing and provided on its inner end with a sun gear at all times enmeshed with said planet gears, a plurality of motor cylinders fixedly secured to said planet carrier and to said intermediate wall for rotation with said rotatable housing and having pistons therein operatively connected to said planet gears, each of said cylinders closed at its outer end by a cylinder head and having a permanent exhaust opening intermediate its ends adapted to be closed by its respective piston during the down-stroke thereof and opened by the passage of the piston in completion of the down-stroke, an annular tubular fluid pressure manifold in open communication with the interior of said cylinders through said cylinder heads thereof, a hub secured to the main housing, surrounding



said engine shaft and having a circumferential groove therein, fluid pressure inlet means at all times in open communication with said groove, a ring secured to said rotatable housing and rotatable about said hub, said ring having a port therein at all times in open communication with said fluid pressure manifold, valve means centrally disposed in and extending through said cylinder heads at the communicating end of said manifold with said cylinders, and each of said valve means having a stem terminating within its respective cylinder and adapted thereby to be opened by its respective piston as the piston nears the completion of its upstroke to thereby admit pressure from the manifold to the interior of its respective cylinder at the beginning of the piston power stroke, and an internal ring gear rigidly secured to one of said end walls of the main housing and surrounding said planet gears and constantly enmeshed therewith whereby one revolution of the planet carrier will impart three revolutions to the engine shaft.

"Air car" develops complications

(21)

BY TOM HOLLATZ

"What happened to that air car?"

That is one of the most frequently asked questions by Times' readers.

Some time ago we told about an air car invented by Lee Rogers of Ft. Myers Beach, Fla. Rogers designed an automobile engine that is powered by compressed air, which he has patented.

Converted from a 318-cubic inch Chrysler engine in a 1977 Dodge Aspen station wagon, the motor is driven by compressed air forcing the pistons up and down in the same manner as gasoline drives an internal combustion engine. Once the engine is primed with compressed air, it runs on a self-sustained cycle that "you could drive anywhere in the country without stopping if you wanted to," according to Rogers who was quoted in a Florida newspaper.

However, some complications have developed with Rogers' air engine, the Times has learned. Rogers is quoted in an interview in Consumers' Guide that there is a slight compressor problem.

At low speeds all the air was used up within 20 minutes, Rogers said. At speeds of 5 to 15 miles per hour the engine doesn't run fast enough to rebuild the air supply in the compressor tanks. Rogers said he needs 2,000 rpms to remake the car's air supply and that's the current problem.

However, Rogers is confident he can solve the problem. "It's a matter of gearing and some slight problems...I am very close to solving the problem." The article also goes on to say that when Rogers solves his problem that his invention is on a verge of causing complete havoc in the automotive world.

One Presque Isle reader told the Times, "I hope Mr. Rogers doesn't sell out to the oil and auto giants." He also said on Monday, Aug. 18, "Call me if it comes to Minocqua, I would like to see it."

So would 230 million Americans!

Rogers' $7,000 brainstorm has been approached skeptically by Chrysler, Ford and General Motors.

The engine is basically a very simple idea. The engine has been converted to house eight air hoses going into each of the eight cylinders from a "distribution block", which sits atop the engine block. The compressor sits forward of the distribution block and controls the volume of air being forced into the engine, which in turn controls the speed of the vehicle. Two gauges on the dashboard show the driver the pressure in the air tanks (which can be placed where the conventional gasoline tanks usually are) and the pressure of the air being forced through the engine.

Rogers' invention, if true, would ignite an automotive revolution not seen in the world since Henry Ford started mass producing the Model T car.

And now the good part. The "air" car doesn't have a gasoline tank, carburetor, fuel pump, spark plugs, points, and condenser. Also removed was the entire exhaust system to accommodate his conversion unit. There are no gasoline fumes. Cold air recycling through the engine can be used to air condition the engine.

Maintenance would require infrequent oil changes, tire maintenance and regular brake checks. Rings and valves could last two to three times longer because there is nothing the foul them, Rogers said.

The father of a Minocqua resident Mrs. Ron Nelson at the Motel Minocqua on Hwy. 51 has reportedly seen the new air car. Her father is a resident of Ft. Myers Beach.

In the Consumer Guides interview, Rogers expressed some "concern" that his personal "life is" being "bothered" by hundreds of letters from persons interested in his invention. He wants his privacy and a normal life.

Mrs. Nelson told the Times that several people have called from all over the state wanting to give her money so she could buy air conversion kits for them. The air conversion kits are not ready for sale at this point in time.

In an effort to give Rogers some peace and quiet, letters concerning the air-powered engine should be addressed to: Consumers' Guide, co Lee Rogers, P.O. Box 2700, Toledo, Ohio, 43606.

In an earlier interview, Rogers claimed that production of the conversion kits could produce 3,000 units a day and be available to the public at $800 to $1,000 apiece. Rogers apparently wants to keep his invention out of the hands of the oil moguls.

The potential of such an air engine is unlimited. In theory, it could power snowmobiles, outboard motors, tractors, home electrical generators and the list goes on and on. It could also power an electric sign or two on New York's Times Square which could, via flashing lights, tell the OPEC nations what to do with their over-priced oil.

Stay tuned!

SECTION C

Eugene Register-Guard

EUGENE, OREGON, THURSDAY, DECEMBER 18, 1980

Regional N

(2)

And with a 30-year warranty...

A car that runs on air? That's incredible!

BY TOM HOLLATZ

There's a television show called "That's Incredible". So is the following story.

Imagine getting 23 million miles to a tank of fuel that reportedly costs no more than the cost of putting air in the tires of your car.

Incredible, right? Very few people believe it, but the father-in-law of a Minocqua motel owner has seen the car and reportedly driven in it in Fort Myers Beach, Fla. Clarence Roessler, the inlaw of Don Nelson of Motel Minocqua, has seen an automobile engine that is powered by compressed air which has been patented by an inventor. Reportedly, the developer has been contacted by major automobile corporation officials, who thus far have expressed unanimous disbelief in the idea, according to a story in the Fort Myers Beach Bulletin newspaper.

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Rogers said he can guarantee the engine for 23 million hours, or 30 years.

Maintenance? The only requirement is frequent oil changes, tire maintenance and regular brake checks. He also claims that rings and valves could last two to three times longer because there is nothing to foul them.

"This could turn our country around," Rogers said in the Bulletin's story. Farmers could convert tractors as could truck drivers. Even snowmobiles and outboard motors could be converted. The list is endless. How about a generator to make your own electricity and heat, for pennies?

Rogers' wife, Betty, admitted that she did not believe her husband until she and a neighbor rode in the car.

"We didn't realize how important this is until we came back and sat down and realized we had ridden in a car that wasn't using gas," she said. The toughest part of their discovery, she added, has been convincing people that it really works.

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Rogers said if he doesn't get support, he will market the idea himself. Nelson said that Rogers wants to help the working man in his constant fight against soaring oil prices and the stranglehold that OPEC has on the U.S. "I hope he doesn't sell out to some car firm which just might put the idea on a back shelf? I don't think he will," Nelson added.

Since the early days of the oil squeeze, people have been saying "There has to be another Edison somewhere in the U.S." If Rogers' air compressor-engine is all that the newspaper story and Nelson say it

Liquid Nitrogen as Alternate Energy

Demonstration car carries cryogenic liquid fuel in vacuum-insulated tank. Released gas expanded in front-end evaporator powers simple air motor. Such vehicles are planned for underground mines and other areas of high explosion risk.

Britain's National Coal Board is working on small vehicles powered by liquid nitrogen for transport in underground mines, where the non-flammable non-toxic fuel has an important safety advantage. This follows successful application for the inert gas to operate standard pneumatic tools.

The system uses normal ambient air temperature to heat and vaporize the nitrogen, which boils at -196 deg C. The gas then expands like steam and can drive an air motor. In this basic form no additional heat source is needed.

The experimental vehicle pictured has a vacuum-insulated storage vessel in which the cryogenic liquid is held at the boiling point. Pressurized vapor is released from the tank and piped through the front-end heat-exchanger where it is warmed and expanded. Gas at 100 psi is then fed to a conventional 2.75-hp four-cylinder non-expansive air motor driving the wheels. The car has a maximum speed of 10 mph, and has been used to demonstrate the feasibility of this energy source for light self-propelled units.

Low bulk gives liquid nitrogen a major advantage over compressed air for automotive applications, since it produces six times the volume of expanded gas for a container of the same size. It is easily stored, and a pressurized vessel is unnecessary, which means much lower weight.

One volume of liquid expands to 640 volumes of gas at atmospheric pressure, while for an equal expansion from a compressed gas a storage pressure of about 9400 psi would be needed. Compared with other non-fossil portable energy sources the liquid has a much higher [illegible] capacity in terms of hp hr/lb than even silver-zinc batteries.

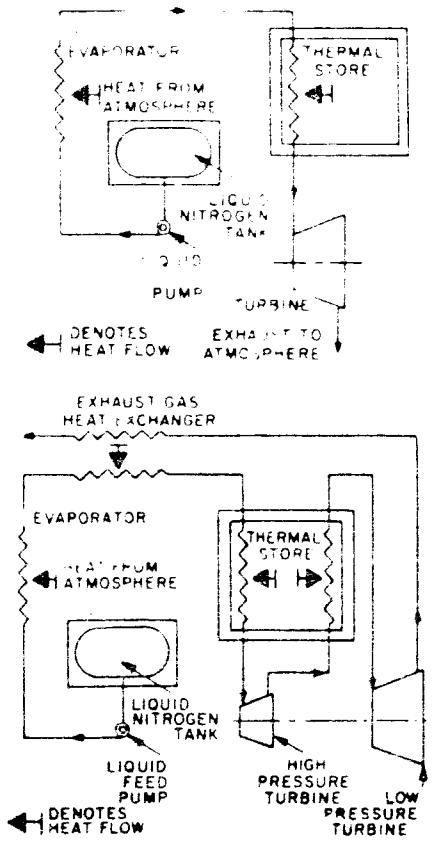
The Coal Board is cooperating with Salford University, near Manchester, which has done considerable theoretical and experimental work on improving the performance of liquid nitrogen engines for road transport. A principle area of study is the use of a thermal store to raise the temperature and thus the expanded volume of the gas fed to the engine. This could dramatically reduce consumption of the fluid for a given work output, allowing greater power or increased range, or a smaller on-board liquid supply.

Possible thermal stores, heated overnight by off-peak electricity, could be solid refractory materials like graphite or alumina rods or bricks through which the gas is passed. Others are eutectic salts using the latent heat of fusion, and units relying on chemical reaction such as the catalytic oxidation of a fuel.

Salford's studies are concerned with turbines rather than reciprocating engines, and these envisage applying the warm exhaust gas to the primary evaporator following the liquid container to raise the heating temperature above ambient. A more sophisticated system would have two-stage expansion with high- and low-pressure turbines, the inlets to both passing through a common heat sink.

Further possibilities for vehicles include a regenerative braking system where the heat developed by friction would be recovered and held in the store. Liquid nitrogen for propulsion is also seen as particularly suitable for refrigerated trucks, when the cargo compartment could be readily cooled by a special evaporator in the heat-exchanger circuit. It would then contribute to the power source instead of drawing on it.

Nitrogen gas is produced commercially in liquid form by distillation from the atmosphere. The liquid is now readily available in bulk relatively cheaply. It is used widely in the chemical industry, steel making and freezing equipment.

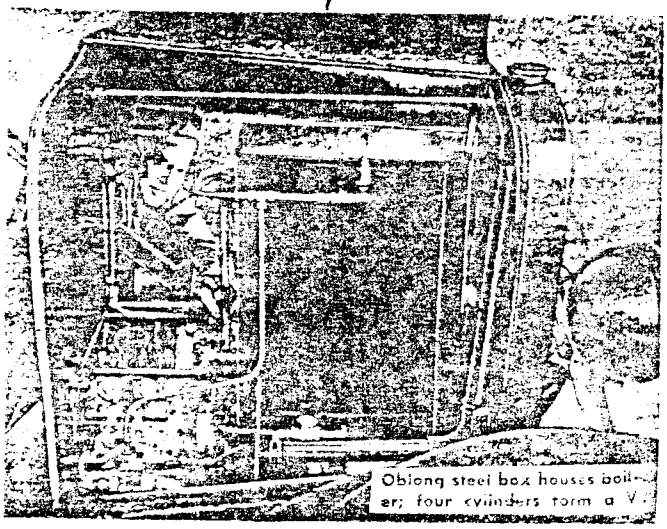


Thermal store in gas expansion circuit could increase efficiency of liquid nitrogen engine. Lower drawing shows two-stage turbine, with exhaust providing additional primary heat step-up. Concepts are patented by Salford University.

The CAR that RUNS on Air

FEBRUARY, 1945 POPULAR MECHANICS

FRANK R. PERRY



Oblong steel box houses boiler; four cylinders form a V

POSTWAR motorists may climb into their automobiles, step on the air instead of the gas, and glide away swiftly and silently at 60 miles to the gallon with never a gear to shift or clutch to shove.

That's the prospect presented by Frank R. Perry, Los Angeles inventor, who has built a revolutionary car called a "Perrymobile."

Untried commercially, it's a novel combination of steamer and compressed air powered automobile. The motive power comes from a secret liquid, which vaporizes at a much lower temperature than water, and compressed air which serves as an ever-ready starting and reserve source of power.

Perry says he has driven several thousand miles with his machine which is mounted on an old Ford chassis. The Perrymobile weighs only 700 pounds—about 1,300 pounds less than standard automobiles powered by the conventional internal combustion engines. The engine installation alone weighs only 140 pounds.

The 30-horsepower four-cylinder engine is turned over by pressures instead of by the explosions that move the pistons of an ordinary auto engine. The Perrymobile engine is essentially the same as a steam engine. Inside each cylinder is a piston which moves up and down and is connected to the crankshaft.

The secret non-inflammable liquid, which boils at about 150 degrees Fahrenheit, is heated by a burner which uses anything from butane gas to crude oil. The car will travel 60 miles at 30 miles an hour on one gallon of butane, the inventor claims. He says this fuel costs about 8½ cents a gallon. (He sets the top speed at "better than 70.") Only one quart of the secret liquid is required in the boiler because it is exhausted as vapor into the radiator, condensed and returned to the boiler.

The vapor passes through an intake valve into the top of the cylinder, and with a pressure of about 150 pounds per square inch pushes the piston down just as steam would do. At the bottom of the stroke the vapor exhausts through a port cut through the cylinder wall. As the piston starts up again a valve at the top of the cylinder lifts so the piston travels upward against no air pressure. At the top of the stroke more vapor is admitted which starts the piston down again.

Each of the four pistons supplies power to the rear wheels every time it is pushed down. This affords "two-cycle" operation instead of the conventional "four-cycle" shift in which each piston gets a shove only every second time it travels downward. Thus Perry's four cylinders put out as many power impulses as an eight-cylinder auto engine.

The compressed air part of the power for the Perrymobile comes from an air tank under the seat. That tank is kept full of compressed air supplied by a small air pump connected by a belt with the engine. The compressed air, which flows through the boiler into the cylinders, is used for a quick start and until sufficient vapor pressure has been built up to run the engine.

To operate this revolutionary automobile, you first open the fuel valve under the hood and the burners catch fire from a pilot light. Then you get in the car and pull down the throttle lever on the right side of the steering column. Compressed air from the tank flows into the cylinders and the car starts to move.

After you have driven a few blocks the flame in the boiler has built up sufficient vapor pressure so you can turn off the air. The pump quickly restores the pressure in the air tank. Heat in the boiler is regulated by an automatic valve.

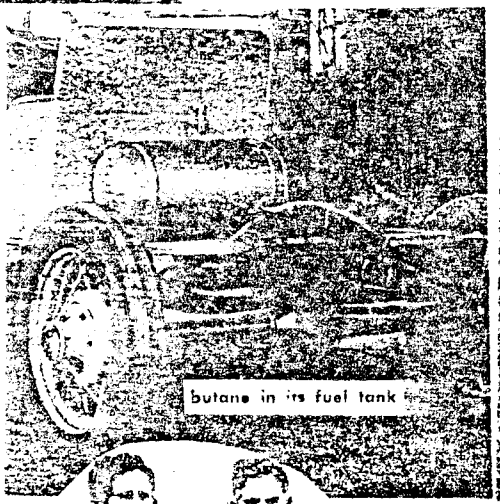
Suppose you are driving out into the country and come to a long sloping downgrade. You close the throttle, just as you would in an ordinary car, and the flame goes low in the boiler, for no pressure is being used. Even while the engine is idling, air is pumped into the tank to maintain a constant pressure. To back up, a control on the left of the steering column changes position of the cams for reversing.

The inventor compares his single control for regulating speed and power to the control lever of an electric motor. The smooth operation of the Perrymobile is due to the fact that the power output is the same at all speeds—from 1 r.p.m. to 4,000. On a gasoline engine the horsepower is in direct ratio to the r.p.m.'s.

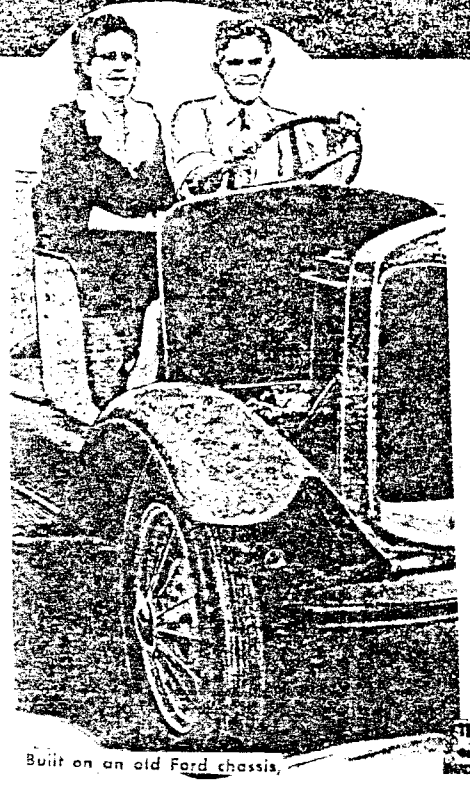
Even at full power with the throttle valve wide open, Perry says his engine runs so cool that the paint has never blistered on the cylinders. This makes the car adaptable to extremes of climate for the liquids in it do not freeze unless the mercury drops to 30 below zero. The engine turns over slowly. At 40 miles an hour it revolves only 800 times a minute compared with 2,000 or more for most present-day cars.

Other advantages of the Perrymobile, according to the inventor, are the "parts it does without." These include clutch, carburetor, spark plugs, distributor, coils, battery, fan, gear box and self starter. The car, of course, is equipped with brakes. Perry estimates that it will require less than one quart of lubricating oil a year. The Perrymobile makes no noise, smoke or smell. So smooth is its operation, he reports, that in a blindfold test it is impossible to tell when the car starts moving.

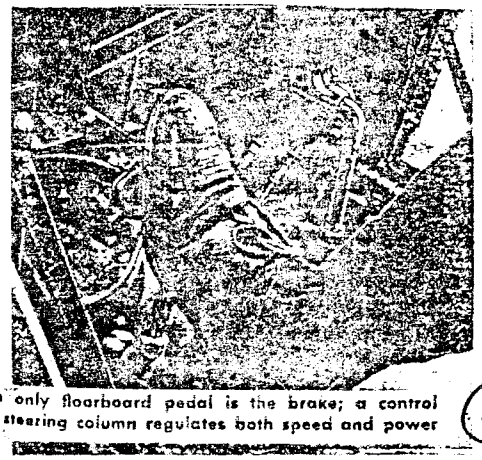
It cost Perry about $400 to build his lightweight automobile, but he says it should sell for much less if it gets into mass production—about $250. He believes the air-vapor engine can be used on helicopters and boats as well as automobiles.



butane in its fuel tank

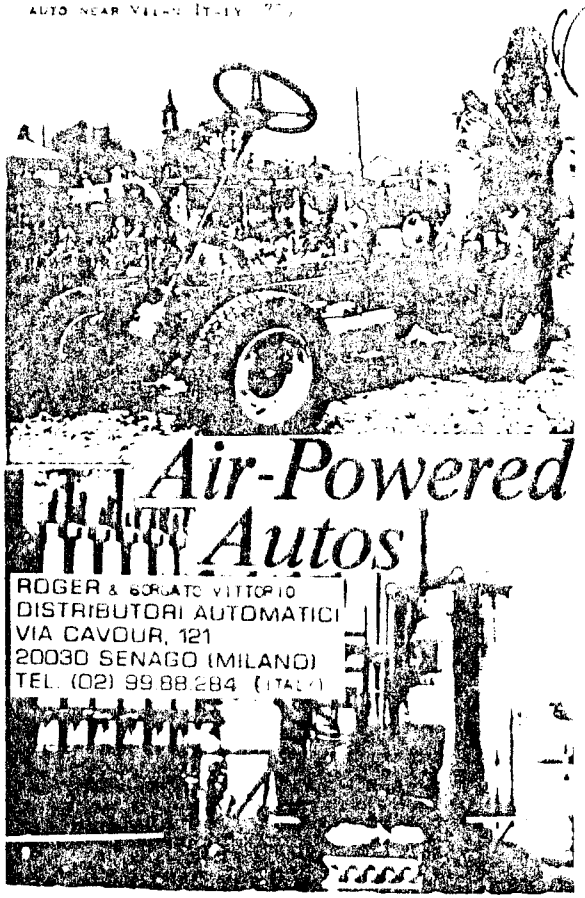


Built on an old Ford chassis



The only floorboard pedal is the brake; a control steering column regulates both speed and power

AUTO NEAR VILLA IT-LY



By Mark J. Harris

Whether parking meters equipped to recharge electric-powered cars could also be fitted out with compressed air outlets is uncertain. But even if air tanks had to be recharged or exchanged at special stations like industrial oxygen tanks, it would not be difficult to put compressed-air-powered cars on the road right now.

Air power has been used for decades to drive a variety of machinery, ranging from rail locomotives to mining equipment and factory power tools. If you have had dental work, your dentist probably prepared the cavities with one of the recently developed air drills that are so fast and powerful as not to require anesthetic in many cases.

There have been isolated efforts to put air-powered automobiles on the road, by tinkerers and enthusiasts who have generally lacked capital for a first-class engineering and production job.

One that was reported to have been quite successful, nevertheless, was the car built back in 1951 by a Los Angeles engineer named Roy J. Meyers. It was driven by an engine of radial (aircraft type) design, with six cylinders. Having an extremely high power-to-weight ratio, like all air motors, the Meyers engine produced over 180 horsepower while weighing only 114 pounds. News accounts of the day—perhaps over-optimistically—reported that the vehicle had a cruising range of several hundred miles if speeds were kept low.

Like steam and electric prime movers, air motors can be perfectly adapted to the unique demands of driving motorcars. Basically, this is because these motors have huge, indeed almost infinite, torque available at low shaft speeds. They need no power-varying torque conversion (transmissions).

The air motors that would be used in an automobile would resemble a steam engine except that, since the air is not hot, they would avoid the lubricant breakdown that is one of the major technical hangups of steam engines.

In earlier years, air power simply employed a large pressure tank, a control valve and a reversible motor to twirl the wheels. There are still railroad engines from the turn of the century operating every day on this principle, in mines and areas where combustion exhausts are prohibited.

The most advanced - and efficient — air vehicles, however, would probably use liquid air to avoid the dangerous pressure vessel that could explode like a bomb in an accident. A warming device, probably operated from a battery, would heat the liquid air enough to vaporize it and build up the pressure that could drive the engine's pistons.

As with the electric car, there would be no pollution from an air-powered vehicle. A very slight oil vapor would be emitted in the exhausted air, but this could easily be removed by filtration.

It is precisely the laggier cities that have become pollution terminal cases where by far the greatest proportion of vehicle miles are driven in the U.S. each year. Electric and air powered cars could be put on the road right now that would immediately halt a sizable proportion of this air poisoning.

But whether such cars would be of much use for over-the-road driving is problematical. An electric car could conceivably take a trip across the country, although cruising range in any electric with a battery no larger that the "guts" of an ordinary gasoline car would, today, be quite limited—probably a maximum of 100 miles. NATIONAL MOTORIST April 1976

Edward J. Saller's choice for an ultimate technological achievement is the automobile circa 1959. By that year, he says, hydraulic brakes were universal, the shift lever had been moved to the steering column, and the automatic transmission had been introduced. Various improvements since, he says, such as dual brake systems and running lights, are not technological breakthroughs. "Many 1959 automobiles still running today," he adds, "will pass 1975 air pollution standards without electronic engineering control devices."

James K. Pace, Jr.

The Boese auto is simply his spl little turbine design attached to the rear end driveshaft of a Ford Pinto. A number of Companys have been interested in developing it and putting it on the market but the inventor has held off on his desisions after his 1st model was 'accidentally' blown up by individuals who had purchased it. (3½ million) Some of the major designs secrets were withheld from the more than 70 patents covering the designs"" 1980 –

By LAURA LAMBERTH
News Staff Writer

He says nobody believes him. And when you look under the hood of the automobile you can understand why.

There's almost nothing there. No engine, no radiator, no fan belts or transmission or motor—just a battery and a strange-looking device called a turbo expander that looks like air conditioner coils. You won't find a gas tank either.

And the car's lubricant isn't Texas tea—it's plain old salad oil.

It's the super-cool car of the future that offers more than a solution to the energy shortage.

The car is powered solely by nitrogen the "ultimate" of designs created by Harold E. Boese, president of Cryogenics Unlimited Corporation.

Boese, a cryogenics expert in the science of super cold phenomena, worked with a partner in the early part of the '70's to build a nitrogen-cooled electrically powered foreign compact.

But the car never drove out of Detroit Boese said because he was told it would take at least 10 years to bring it out on the market.

Boese went back to his work as an electrician, but kept his ideas and theories in his head.

Now he's back to work on his designs after receiving a request from government officials to help find a solution to the energy shortage he said.

The updated design doesn't require electrical power and liquid the only part it needs is a small cryogenic motor attached directly beneath the rear end of the vehicle. The motor costs about $20 to rebuild in less than 15 minutes, and it's guaranteed to last at least 10 years without spark plugs, wiring or other accessories.

Liquid nitrogen, which is kept in the car's special tanks at a cool 320 degrees below zero, enables the motor to be thermostatically operated at minus 110. The super-cooled gas, after it passes through the motor casing, flows through a "turbo expander" to a master coil with additional turbos, where it increases its volume 750 times into a volume tank.

The finished gas is then passed harmlessly into the atmosphere where it is no question—comprised of nitrogen thus making the car totally pollution free.

And liquid nitrogen is non-combustible so there's no danger of fires or explosions from the automobile's tanks, making the car safer than anything being driven on today's highways.

As added luxury is air-conditioning without a compressor, and a refrigerator that can be installed for a bar or whatever, easily cooled by the liquid nitrogen flowing through the tanks and tubing. Boese said liquid nitrogen is available at every major truck stop in the country, and it would only take five and a half hours to put a tank up at a gasoline station. It costs about 20 cents a gallon to manufacture liquid nitrogen and probably would sell at 40 cents a gallon before it's too.

The converted automobile gets about 25 miles to the gallon, but after Boese completes his designs he expects a new vehicle will drive on about [illegible] a new design might now be has and 50 gallon tank hooked up to the back of a Pinto but a redesigned car simply would carry tanks underneath the rear end.

Boese said he doesn't plan to convert cars to cryogenic power because, once converted, the car would have a lot of useless space under the hood. "I'd have to throw away a lot of engines," he said.

His hopes are to design what he calls a "hybrid" vehicle, unconventional by today's standards, that would sell for about $4,000 on the market.

His dream is to build a manufacturing plant in the Galveston area if he can get enough financial backing through interested parties or the government. If all goes well with testing and designs a car could be out on the roads in three years, he said.

"They'll have an electric car available by 1985. It goes 50 miles at 60 miles per hour, or vice versa," he said. "Then it sits for 12 hours to recharge."

"So who wants that?" Boese asked.

Boese [illegible] have been working on the mechanical designs of the car and Fred C. Ewald, Boese's partner, has provided the financial backing that has made the project possible.

The automobile sits in the yards at A-1 Rentals, friends of the company who provide security.

Boese and Ewald plan to show the car at Expo '80 in St. Louis this May.

Boese holds 70 patents in cryogenic [illegible] participating in the design of the car that was driven on the moon, as well as the freezing of the first human beings.

He virtually taught himself the concepts of cryogenics when he read an article on the subject 20 years ago while working in the Frozen Right Products Division of Morris Mills Inc. in Dallas.

He said he believes cryogenics currently an undeveloped field may be an up and coming area of study as an alternative energy source in the future since atmospheric gases are easily accessible.

The cryogenic car is one project Boese is excited to talk about but he has other ideas he's keeping quiet right now, which he'll be showing in the near future that he promises will be [illegible] interesting.

Take a ride in his super-cool cryogenic car and maybe you'll believe him.

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AUTO WITH AIR-POWER MOTOR COSTS LITTLE TO RUN

Compressed air has been harnessed to operate an automobile successfully at no cost for fuel. The car has a tank for its air, which is carried to the train axis on by a small engine resembling a radial airplane motor. There is no cooling system, no carburetor, no ignition system- nothing except the small air motor controlled by the air throttle. There is no noise except a slight hiss from the exhaust. As the air goes through the engine, most of it is recaptured and recompressed.

ing Up the Air Tank of Compressed Air Auto; Note the Small Radial Engine

Bath man develops engine that runs on nothing but air

By PETE ESPOSITO

BATH — William Long of Bath has invented an engine he says runs on air — the limitless air all around everything and everyone, everywhere.

Just the thoughts of its possible ramifications boggle the mind:

An endless supply of no-cost fuel, free, gratis. Pollution and energy source problems solved in one fell swoop, relatively quickly and inexpensively.

Long, 54, is a self-employed carpenter and plumber who learned his skills through a lifetime of "tinkering with all kinds of machinery" while working at a variety of jobs.

He has had no further formal education since he left high school in 10th grade because he was needed to help on the family farm near Addison. "You learn to do more things on a farm than you can imagine to keep things going," Long said.

Long began "visualizing" the engine in his mind, he said, about 25 years ago and soon after was working on it sporadically over the years.

Four years ago he accelerated work on the engine, "giving it just about all my spare time — nights, weekends, holidays and Sundays," he said.

His son, Timothy, a tool and die apprentice, made several parts for the engine and helped him assemble it and it was completed several months ago after an estimated 5,000 hours of work went into it during the four-year period.

Long's engine looks like and operates like an air compressor. A regular electric-powered air compressor is used to start his engine, but after it is started the air compressor is disconnected and his engine continues to run on the air it takes from the air around it, Long says. He has run it continuously for varying periods, the longest five days and five nights, he said.

The engine has a tank about three feet long and 18 inches in diameter, a flywheel, a single cylinder and several other parts. It is about four feet wide and four feet high overall and weighs about 175 pounds. He has no name for it other than "the engine." He calls it a "working model" and others can be made larger or smaller.

"All I've done is learn to control air, how to store it and use it," Long stresses. He feels the situation is similar to being at the threshhold of the beginning of the practical use of gas and oil.

He is reluctant to disclose all details about his engine because he has not patented it and is currently in touch with three nationally-known companies who have shown some interest in it.

One auto company already has just about said "not interested." Officials of area companies also are aware of Long's engine and have discussed it with him.

One mechanical engineer told him, "basically, what I have is against the law of physics — it's not in the engineering manual and so it doesn't exist," the easy-going Long said, laughing at the recollection.

"I'm not using perpetual motion — there is no such thing; I know all about that," he added.

"I've been called everything from a crackpot to a basket case and been laughed at by the best of engineers and other people. Do I mind? Hell, no. I know I know what I have; you can't discourage me a bit. The crackpots might be those that can't see past their noses."

Long says he wants "to see this (his engine) do people some good." His engine can be used, he said, as a stationary power source, to operate, for example, a lathe or other factory machinery, or adapted to power a car or truck. He is currently toying with the idea of installing his engine in a small pickup truck.

Long also said a top federal official involved with energy is aware of his invention. He hasn't heard anything further from this source to date, he said.

Bringing feelers from some possible users of his engine were a recent report of it in an area newspaper and his appearance with the engine on an area television program.

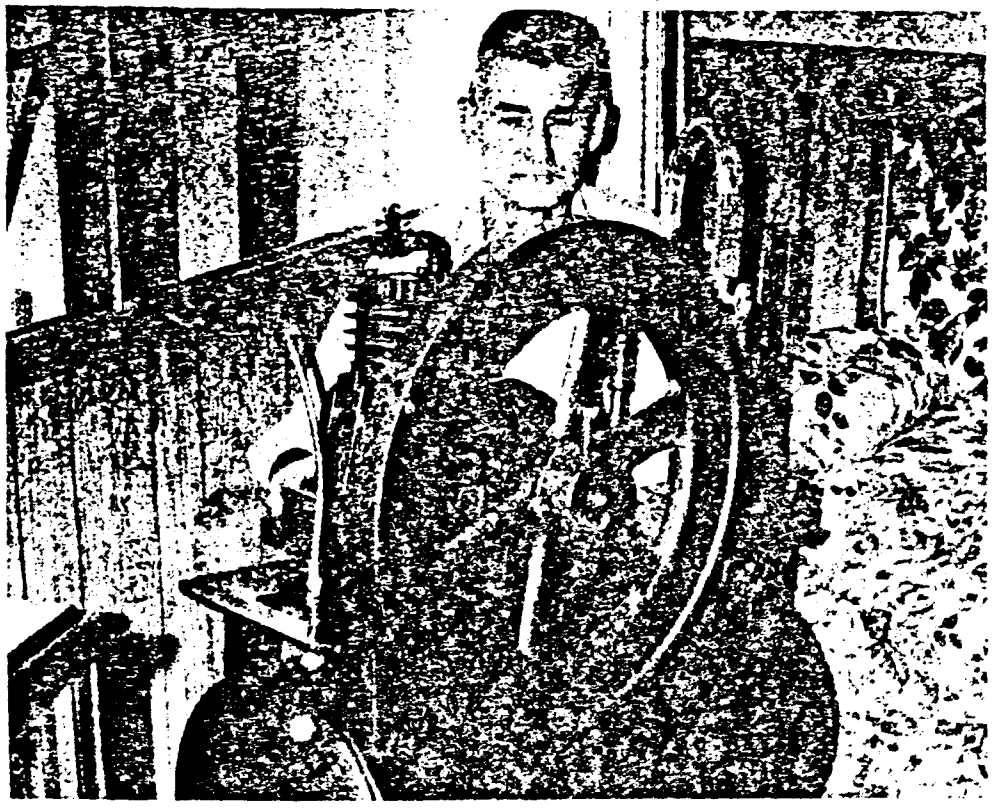
"All I want from this engine is enough for me and my family to be able to get along the rest of our days," Long said.

His wife, the former Miss Pauline Jackson of Corning, seems to be as knowledgeable about the engine as its inventor. There is no doubt she has been a staunch supporter throughout, with her husband 100 per cent. The couple also has a married daughter, a librarian, working in a school in the south.

After his marriage during World War II, he left the family dairy farm and bought and operated his own in the Town of Addison. He sold it because he expected to be called into the army, but he wasn't summoned.

If he isn't able to sell his engine soon, Long said, "I'll put it in my pick up truck and drive it to Washington, D.C. and maybe that'll wake up some people."

FROM THE SUNDAY TELEGRAM, ELMIRA NEW YORK, JULY 31, 1977



William Long and "the engine."

RETURN OF MAXWELL'S DEMON
Background for a Neal Equalizer Design Manual

compiled by Scott Robertson

Contents

Turbine unit is so light that Lear can hold it in his hands. Vapor Turbine System saves more than 500 pounds compared with diesel

POPULAR SCIENCE
JULY 1972

Bill Lear, the inventor of the Lear Jet, also wanted to build self-fueling air cars. He visited Bob Neal's son more than once, trying to get him to remember more details of the Neal equalizer. Unable to discover the working principle behind the equalizer's anomalous ability to get low pressure air into a high pressure tank, Lear gave up stalking the equalizer and spent millions developing his steam turbine for transport vehicles. His project dead-ended when he found that his clean, quiet, and powerful steam turbine was as costly to fuel as the internal combustion engine.

Pneumatic Options • 6333 Pacific Ave. #153 • Stockton, CA 95207

United States Patent [19]

Yeh

[11] **4,163,367**

[45] **Aug. 7, 1979**

[54] **HYBRID FLYWHEEL/COMPRESSED-FLUID PROPULSION SYSTEM FOR NONSTATIONARY APPLICATIONS**

[76] Inventor: **George C. Yeh**, 2 Smedley Dr., Newtown Square, Pa. 19073

[21] Appl. No.: **867,694**

[22] Filed: **Jan. 9, 1978**

[51] Int. Cl.[2] **F15B 1/02**

[52] U.S. Cl. **60/414**; 60/416; 60/643; 60/668; 180/165; 180/302

[58] Field of Search ..... 60/371, 407, 408, 413, 60/414, 416, 643, 659, 668, 698, 701; 180/44 F, 44 M, 65 A, 66 B; 74/572

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3,379,008	4/1968	Manganaro	60/408 X
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4,043,126	8/1977	Santos	60/407

FOREIGN PATENT DOCUMENTS

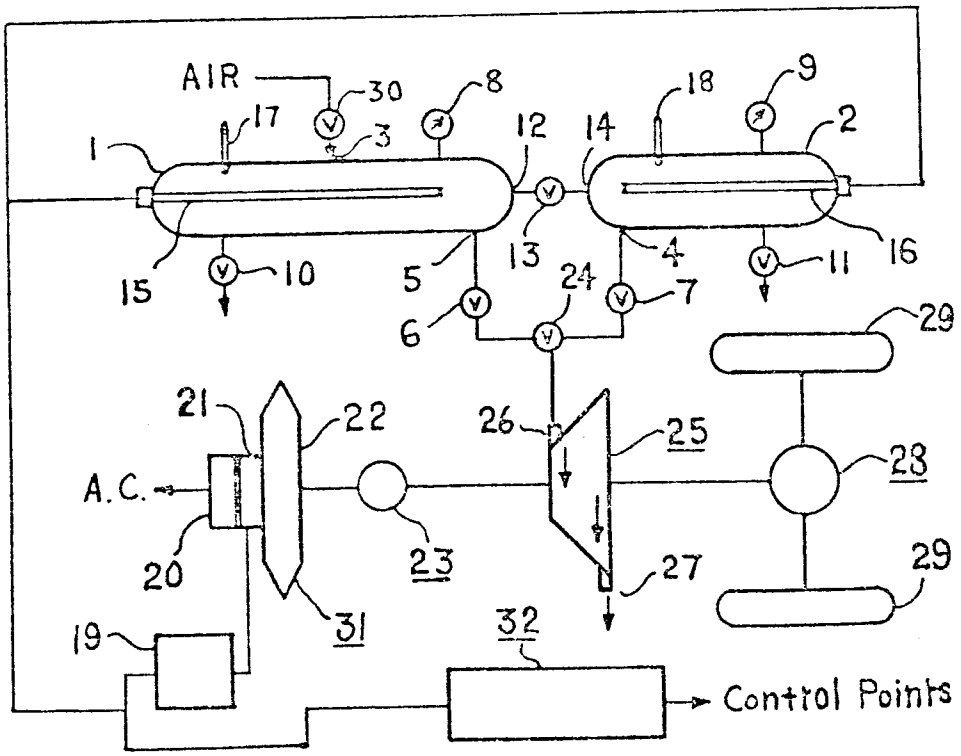
2359721	6/1975	Fed. Rep. of Germany	180/66 B

Primary Examiner—Edgar W. Geoghegan
Attorney, Agent, or Firm—James Albert Drobile

[57] **ABSTRACT**

The adaptation of a compressed-fluid (such as compressed-air) powered turbine in conjunction with the use of a flywheel as a hybrid propulsion system for nonstationary applications, such as vehicle drive, is shown and its practicality demonstrated. This propulsion system requires a nonpolluting fluid, such as air, and a source of mechanical or electrical energy to compress said fluid and energize said flywheel, both of which act as energy storage media. An expander/compressor unit, such as a turbine, is used for converting the stored energy of said compressed-fluid into shaft power by expanding said fluid, and recovering the braking energy during vehicle deceleration by compressing and storing the atmospheric air (if air is used). Said flywheel is used not only for providing peak powers necessary for vehicle acceleration but also for recovering the braking energy during vehicle deceleration and refilling said compressed-fluid in an emergency. The propulsion system can use the unlimited supply of air as the primary energy-storage medium and said flywheel as the secondary energy-storage medium. The propulsion system is not only regenerative but also quick-recharging; it, therefore, has high energy-efficiencies and broad applications.

6 Claims, 2 Drawing Figures



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United States Patent [19]

Rilett

[11] **4,224,799**

[45] **Sep. 30, 1980**

[54] **GAS-OPERATED MOTOR SYSTEMS**

[76] Inventor: **John W. Rilett**, 18 Links View, Stratton, Cirencester, Gloucestershire, England

[21] Appl. No.: **925,398**

[22] Filed: **Jul. 17, 1978**

[30] **Foreign Application Priority Data**

Jul. 16, 1977 [GB] United Kingdom 29987/77

[51] **Int. Cl.**[3] **F01K 25/10**

[52] **U.S. Cl.** **60/671**; 60/685

[58] **Field of Search** 60/651, 671, 685, 650, 60/682

[56] **References Cited**

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4,092,830	6/1978	Rilett	60/671

FOREIGN PATENT DOCUMENTS

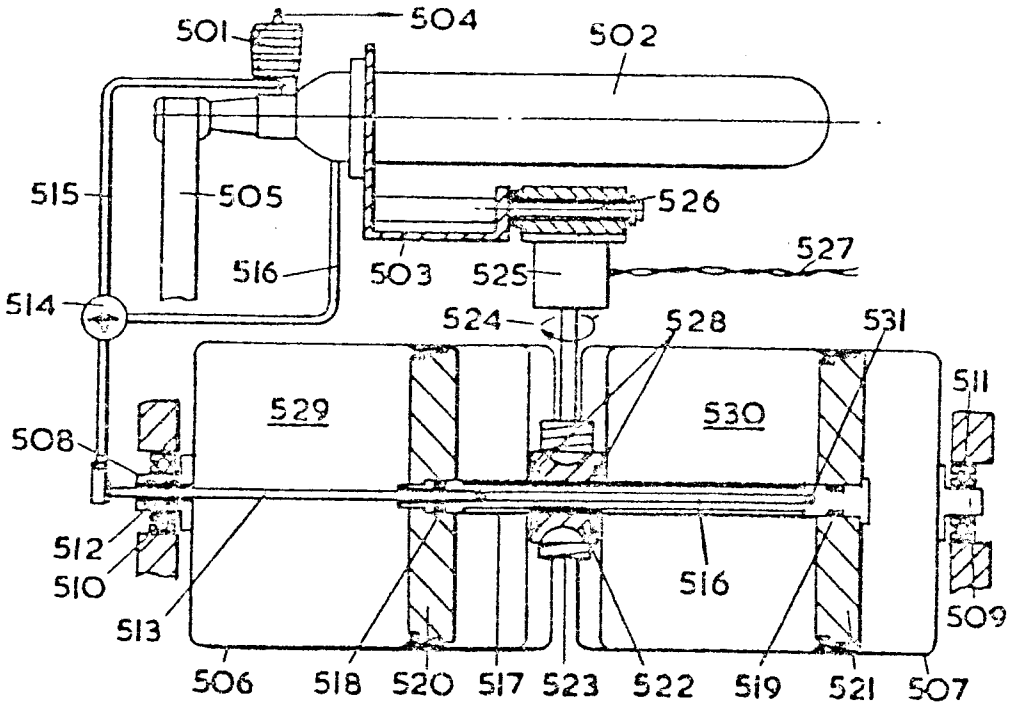
2326596	4/1977	France	60/651
155220	6/1921	United Kingdom	60/685

Primary Examiner—Allen M. Ostrager
Attorney, Agent, or Firm—Dennison, Dennison, Meserole & Pollack

[57] **ABSTRACT**

A gas-operated motor system of the stored energy type—as disclosed in U.S. Pat. No. 4,092,830—in which the gas exhausted from the motor is ducted to a chamber during operation of the motor and thereafter compressed back into the gas reservoir vessel. Recompression may be achieved e.g. by providing the exhaust gas chamber with a movable piston, or by running the motor in the reverse mode as a compressor.

10 Claims, 3 Drawing Figures



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United States Patent [19]

Cook

[11] **4,178,759**

[45] **Dec. 18, 1979**

[54] **ION REPULSION ENGINE AND METHOD OF OPERATING SAME**

[76] Inventor: Billy G. Cook, 140 E. Millan St., Chula Vista, Calif. 92010

[21] Appl. No.: 894,474

[22] Filed: Apr. 7, 1978

[51] Int. Cl.[2] F03G 7/00

[52] U.S. Cl. 60/721; 310/10

[58] Field of Search 60/721; 310/10

[56] References Cited

U.S. PATENT DOCUMENTS

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4,087,976	5/1978	Morrow, Jr.	60/721 X

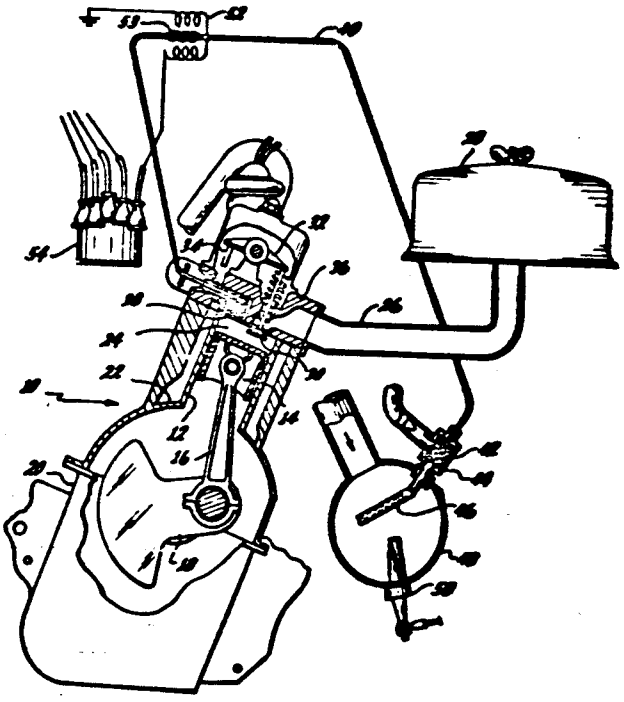
Primary Examiner—Allen M. Ostrager

Attorney, Agent, or Firm—Frank D. Gilliam

[57] ABSTRACT

A reciprocating engine utilizing the mutual repulsion of charged air particles to drive a work-producing means. The engine has pistons reciprocating in cylinders with cylinder spaces between cylinder heads and the pistons. A first enclosed porous conductive electrode is located in fluid flow communication with the cylinder space, typically within the cylinder space itself. The first porous electrode is electrically connected to a second conductive porous electrode in a separate housing. Air is admitted into the first electrode while fuel is admitted into the second electrode. As the air in the cylinder space and first electrode is compressed as the piston moves toward the cylinder head, a current flow takes place from the first electrode to the second electrode because of valance attraction between fuel molecules and oxygen electrons resulting in the ionization of oxygen and fuel. Preferably, the two electrodes are maintained at an elevated temperature to enhance the air/fuel reaction to provide improved ionization. An electrochemical reaction occurs similar to that which occurs in fuel cells. The mutual repulsion of the charged ions in the cylinder space and first electrode produces a strong force on the piston, in accordance with Coulomb's Law, resulting in a piston power stroke. The ionized gases from the cylinder and the external housing are exhausted to a combustion chamber for the completion of the air/fuel chemical reaction. During the initial stages of the compression stroke, premature ionization may be prevented by inducing a potential in the inter-electrode conductor opposite to that produced during ionization.

11 Claims, 12 Drawing Figures



RUSSELL R. BROWN USP # 3 765 180

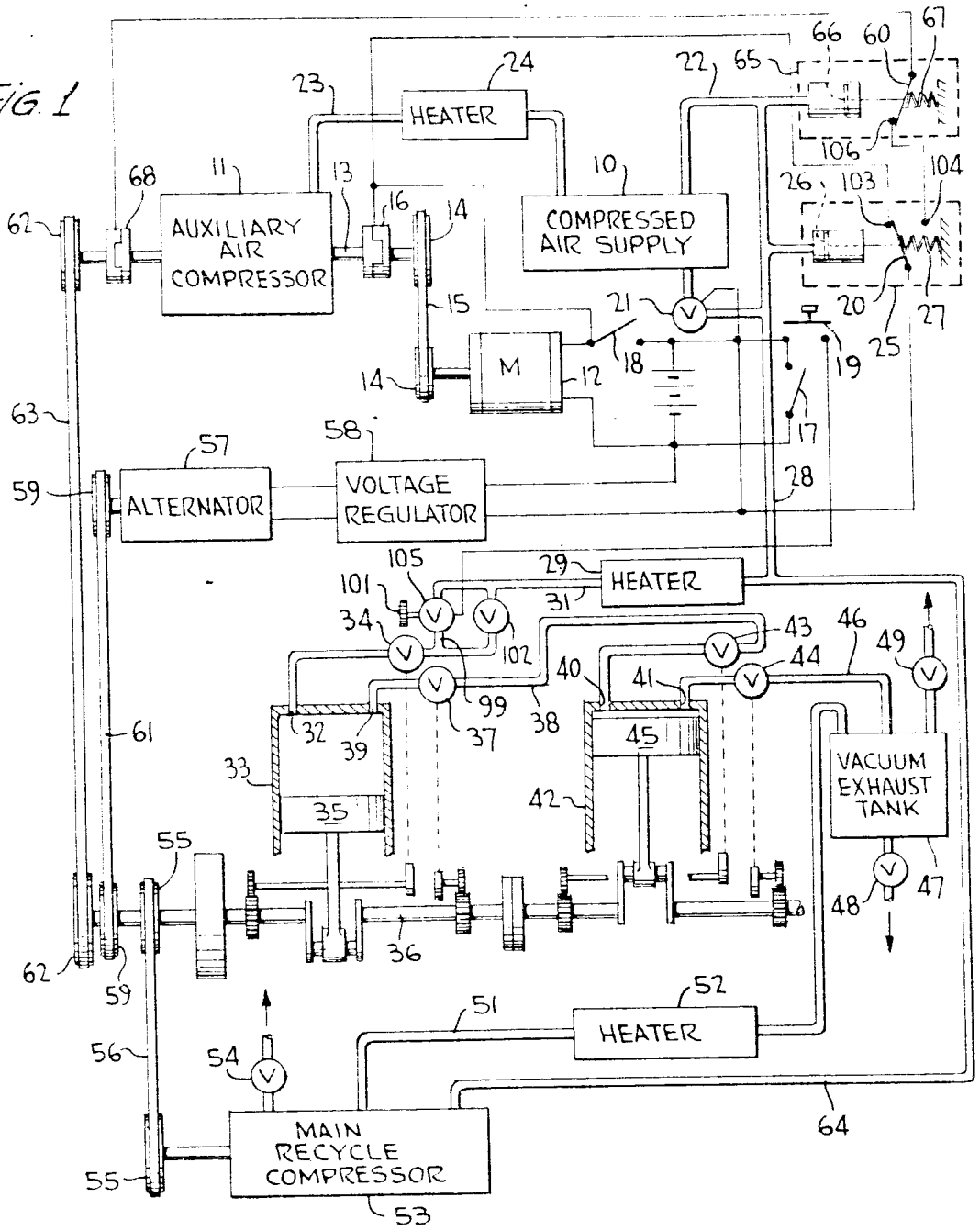
Oct 16 1973

COMPRESSED AIR ENGINE

PATENTED OCT 16 1973 3,765,180

SHEET 1 OF 4

FIG. 1



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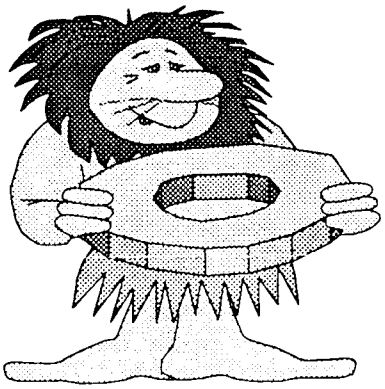
March 1996



AIR CAR FEVER OUT OF CONTROL!

For sixteen years I've been the lone voice in the wilderness. I've told the truth about air cars to anyone who would listen. I've spent what little money I could spare out of my personal funds and donations from others to build working models of concepts that others have already proven to their own satisfaction but refused to demonstrate to the public. I've accumulated thousands of pages of documentation to show that the dynamics of a tank full of air can be arranged to admit low pressure air into a high pressure tank at an almost negligible cost. I've solved the riddle that physicists have been calling Maxwell's Demon since the father of modern physics first posed the question in 1870. I've discovered the secret of secrets in the world of pneumatics, which is that compressed air can be manipulated to provide vast quantities of free energy whose source is solar heat.

In my enthusiasm to present this clean, safe energy source to the world, I've poured everything I have, and more, into the hope that someone out there with ample resources would want to know and share as much about air cars as I would. Since I'm not an engineer, not a machinist, not a mechanic, not an inventor, and not a fundraiser, my desire to achieve my goals through my own efforts alone was doomed from the start! Response to a recent ad has not been enough to justify producing the plans. Those who've ordered plans will get a refund and a free 40-page catalog of my research findings, and pretty soon they can sell me a set of air engine plans. As I am about to explain, I have settled on a new ordering of my priorities, and my plans are not going to be available for some time.

A new attitude towards this project seems to be in order, so I'm celebrating my 40th birthday by accepting my role as a researcher and compressed air advocate; a self-educated guesser, not an engineer; more enthusiast than entrepreneur, more advocate than capitalist. I will no longer take the approach of the inventor who wants to push a particular design. While I do have my own pet ideas, I don't want to limit my perspective to what I personally prefer. I want to build an organization whose purpose is to help anyone who wants to develop efficient power production using pneumatic means, instead of trying to get there first myself. I am quite capable of learning the skills of engineer, machinist, and mechanic, but this comes slowly because of time and money

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constraints. The results we all need to see—working models—will come faster if I concentrate on raising funds using the marketable skills I already possess. When the money is there to pay an engineer to design a working model, and a machinist and mechanic to build it, then the set of plans will become available. I will soon be setting up businesses in Oregon that will take care of ordinary research costs, and instead of beating my head against the wall trying to do everything myself, I will begin to assemble a scientific, educational, non-profit organization to attract the kind of funding needed to build working models. I will get professionals working on the pneumatic solution, and then you will get your set of plans, and if you want your pneumatic power plant to be the firstest with the mostest, then my storehouse of information is there to help you get what you want. I know you want to study, design, or build an air engine or your name would not be on my mailing list.

I've already designed and built a working prototype of the torquerack engine; the plans I'm developing are for a larger, more robust, more efficient, technically superior version of the same engine. The preliminary sketches are finished, with the exception of the framework and valve operating gear. I've already bought most of the parts to build the engine, and will begin building it as soon as the rough sketches are finished in a year or two or sooner if I get funding. For those interested in the video, the price has gone down. It shows the working prototype of the torquerack engine, along with an explanation of the basic components, and is 11 minutes long. In its present format it will go for $15 instead of $30 as advertised. If you have any questions, please call, fax, or write. My California address is a permanent mailing address, as is the fax number. My Oregon phone number will be 541-683-4401 as of June 15.

SCOTT ROBERTSON
Founder, Pneumatic Options

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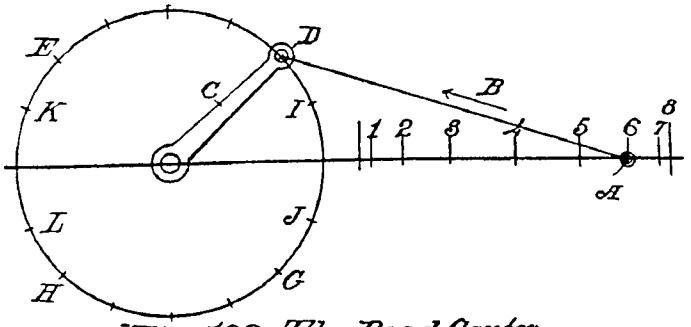

Fig. 108. The Dead Center.

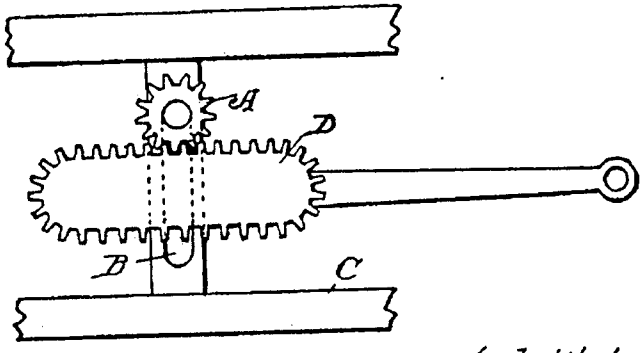

Fig. 109. Crank Motion Substitute.

PNEUMATIC OPTIONS

Dymaxion Pneumatics and the History of Compressed Air

Research findings for Engineers, Environmentalists, and Inventors
compiled by Scott Robertson

* * * * *

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we'll be buying breathing air from the boys that brought us smog.

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