

AUTOMOBILE NEWS

COMPRESSED AIR AUTO STARTER IS MADE IN DENVER

Henry Goedertz is inventor of Device Operated by a Single Stroke

Henry Goedertz, chief engineer of the Masonic Temple, Denver, is the inventor of an automobile engine starter operated by compressed air. It is a single stroke, single-acting air-compressing device, supplied from a small storage tank under the machine, with an air valve for pumping up tires. The entire device weighs only fifty pounds, according to Goedertz, and is capable of supplying 150 pounds pressure that can be pumped up in fifteen minutes and that is sufficient for twenty starts.

The compressor of the device is operated directly from the automobile engine. Goedertz declares it is fool-proof, much simpler than the electric starters and much more economical to operate. He declares back-firing will not injure or interfere with the function of the machine.

The mechanism not only starts the automobile engine by the compressed air obtained from its reservoir, but it also serves to supply air under pressure to the reservoir at any time its replenishment is required. The cylinder is connected with the reservoir by a branched conduit to connect with two separate openings in the cylinder head. Valves in these conduits are operated by means of levers on the driving wheel, to regulate the passage of air in or out of the cylinder. A valve is attached to the air reservoir to be used in inflating tires, by means of a rubber hose. A pressure gage in front of the driver's seat indicates the amount of air in the reservoir.

When the starter is inactive, the crank shaft is held in position slightly off its upper dead center. It maintains the piston at the position it occupies after its upward stroke. The engine shaft is connected with the starter by means of a sprocket chain. By admitting air into the upper end of the cylinder, the piston returns to its original position by means of a tension spring, and the valves of the cylinder are opened and closed automatically and in conjunction with the piston movements.

To replenish the reservoir, a lever is moved to close the opening in the cylinder head, and a secondary transmission member operates the piston in a manner to draw air into the cylinder and thence into the reservoir, where it can be stored up to 150 pounds pressure to the square inch. The air compressor can be operated at a cost far below that of operating an electric starter. Goedertz intends to put his product on the market.

CEDAR POINT IS SCENE OF GREAT CAR CONFERENCE

More Than 150 Managers of Federal Motor Truck Company Gather at Banquet

Cedar Point, O., was the scene last week of one of the most successful sales conferences ever held by the Federal Motor Truck Company of Detroit.

One hundred and fifty district managers and dealers from every state in the Union assembled in Detroit on Wednesday, where they took a steamer, chartered for the purpose, to Cedar Point, arriving about 6 o'clock that evening.

Addresses and discussions by executives and salesmen occupied the morning and afternoon business sessions, held in the large convention hall. Traffic research, sales promotion and advertising were the principal topics.

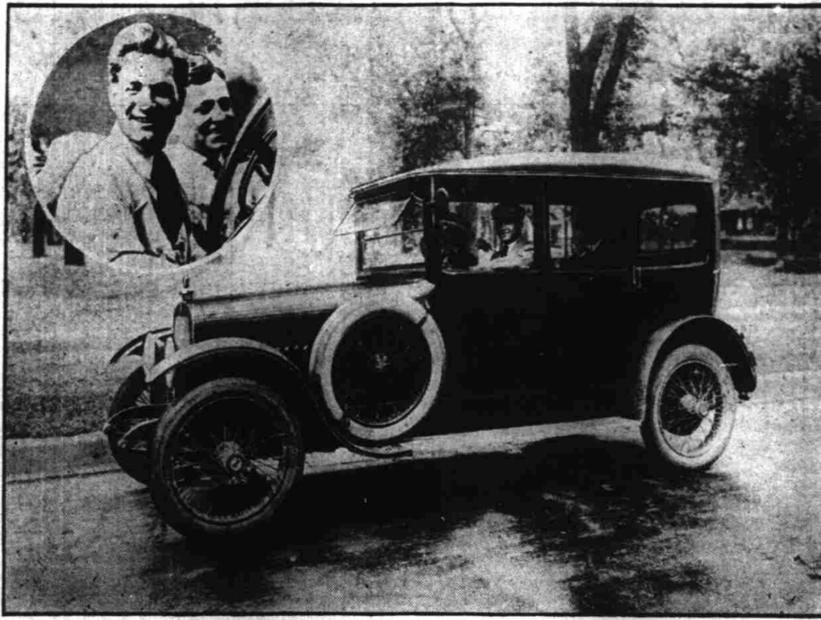
New 1917 models of Federals were on display and were the center of interest after their arrival on Friday. The enthusiasm with which these models were received is evidenced by the fact that for one of the new models alone the dealers placed definite orders with Director of Sales J. F. Bowman amounting to over one million dollars.

A banquet on Friday evening was the closing feature of the conference. This was held in the grillroom at the Breakers. The speakers of the evening were Chief Plat of the fire department of Middletown, Conn., who came from New England to tell the Federal dealers how a Federal had saved his city \$1800 per year. The other speakers were E. St. Elmo Lewis of Detroit, who told the dealers that the best salesmen were the men who could dominate the situation with a prospect. He said: "You have got to know enough about the business of a store or firm to get the authority to tell them how to apply your product, motor trucks, to his or their problem."

M. L. Pulcher, vice-president and general manager of the Federal Motor Truck Company, conducted the convention and in one of his talks to the men said: "The Federal Motor Truck Company is just concluding the most successful year in its history. Production has jumped way beyond our estimates and sales have kept pace with the production. New buildings have been necessary—until the Federal now occupies acres where five years ago the space was feet. "Further expansion is necessary and new buildings will be started in the spring to take care of the increased output, which will be speeded up to fill the orders which you have placed. "Over 60 per cent of this year's sales have been from repeat orders, and that is a record of which the Federal Company has a right to feel proud."

Bumpers behind and bumpers in front are advisable for the driver in city traffic of today. Automobiles roll along so close together that a stop a mile ahead means a general chucking along the line, how far no one knows, but often for weeks.

Looks Strange to See De Palma In Sedan



Ralph De Palma, who has shared honors with Dario Resta for the American speedway supremacy this season, is the owner of a Super-Six Touring Sedan. This car is used for touring and general utility by De Palma and his family. His pit men go to the speedways in it. Mrs. De Palma and her friends view the races in which her famous husband competes from its luxurious seats.

A Hudson representative chanced to come across De Palma in a garage tinkering about his Touring Sedan one day and asked him why he had selected the Hudson Super-Six Touring Sedan.

With his characteristic broad smile De Palma replied, "Because I like its looks." Asked if the car had run up to its looks, De Palma said, "It certainly has. I like the car very much indeed. I have been able to get 65 miles an hour out of it over ordinary roads, despite the big top. I think this type of car is gaining friends among those who appreciate its many advantages and are willing to pay the difference in price. The Super-Six carburetor is splendid and in the same class with its smooth-running compensated crankshaft."

er the current of water through the pump the greater the pressure required to overcome the internal resistance of the pump.

When there is no current through the pump the difference into the pressures indicated by two gauges connected to the terminals of the pumps will represent the total pressure produced by the pump. The part of this total pressure which is available to act on the external circuit and produces a current will depend upon how much of it is used within the pump itself. It is obvious that the pressure between the terminals of the pump when there is a certain current through it will be greater for a low internal resistance than for a high internal resistance. Hence it is desirable to have the internal resistance of the pump as low as possible in order that just as much of the pressure it produces be available at the terminals of the pump. The pressure between the terminals of the pump will change as the current through the pump changes, even though the total pressure produced by the pump remains constant. The larger the current in the pump the lower the difference between the terminal pressures.

All of the pressure produced by the battery or generator is not available at the terminals, as a part of the pressure is used in causing the electricity to flow through generator or battery. The opposition offered by the generator or battery to the flow of the electricity through it is called the internal resistance. The action of the internal resistance of the generator or battery is exactly the same as the internal resistance of the pump. It results in the pressure between the terminals of the generator or battery, decreasing as the value of the current through them increases, assuming the total pressure generated remains practically constant. A few simple examples will perhaps give the reader a better understanding of the effect of this internal resistance upon the operation of the electrical circuit.

Internal Resistance of Battery
The total pressure generated in a certain storage battery is 6.8 volts and the internal resistance of the battery is .04 ohm. What will be the pressure between the terminals of the battery when the battery is supplying a current of 20 amperes?

The pressure required to produce a current of 20 amperes through a resistance of .04 ohm is equal to the product of the current and the resistance, .04x20, or .8 volt. The pressure available at the terminals of the battery will be equal to the total pressure minus the pressure required to produce the current through the internal resistance, or 6.8 minus .8, or 6 volts.

If several batteries similar to the above be connected in series so that their pressures are all acting in the same direction around the circuit there will be a decrease in the value of the pressure between the terminals of each of the batteries as the current in the circuit increases in value. The decrease in pressure of the different batteries will be the same provided their internal resistances are equal in value. If the internal resistance of the different batteries is not equal there will be a greater decrease in the value of the pressure between the terminals of the batteries of larger internal resistance than between the terminals of the batteries of lower internal resistance.

It may happen that the internal resistance of one or more of the batteries is such that the pressure required to cause the electricity to flow through its internal resistance is

greater than the pressure produced by that particular battery, which results in a part of pressure produced by some other battery of lower internal resistance being used to cause the electricity to flow through the battery of higher internal resistance.

This state of affairs may exist in a circuit composed of a number of dry cells connected in series. The pressure produced by each of the dry cells may be the same when measured by means of a voltmeter, and there is no current through them except that required to operate the voltmeter. If a current be taken from each of the cells it will be observed that there is a decrease in the voltmeter reading, due to a part of the total pressure being used within the cell. The internal resistance of some of the cells may be such that it will be impossible to get a very large current from the cells even if their terminals be connected directly to the ammeter. A call of high internal resistance may do more harm in a circuit than it does good.

For example, when the pressure required to cause the electricity to flow through the internal resistance is greater than the pressure the cell is producing, the cell is a hindrance rather than an aid to the operation of the circuit. All of the cells may help in producing the current when the value of the current is small, but with an increase in current some of the cells may prove to be worthless or a hindrance to the operation of the circuit.

The above discussion leads to the conclusion that the condition of a cell cannot be determined by measuring its pressure alone, but the ability of the cell to deliver current or the decrease in pressure between its terminals with an increase in current must be determined. A more detailed discussion of the internal resistance of a cell will be given in the section on batteries.

Los Angeles police last year arrested one person for every 12 of population.

SEES EARLY USE OF KEROSENE AS FUEL FOR MOTOR

Automobile Magazine Believes Days of Gasoline as Motor Combustible Numbered

The widespread efforts to perfect devices which will make the use of kerosene as automobile fuel practicable are responsible for the following editorial in The Automobile:

"The stimulus given to the use of kerosene in internal combustion engines on both sides of the Atlantic simultaneously cannot fail to have a great effect on the automobile industry. The rising price of gasoline in America has made it almost impossible to operate a tractor on the lighter fuel; many trucks are now running on kerosene, and devices are appearing which will function well in passenger car service.

"In England government control of gasoline has almost shut off supply from passenger car users and has restricted the commercial vehicle supply greatly, so that a man must burn kerosene in his engine or allow his machine to lie idle. The inventive genius of two great engineering nations is thus concentrated on the one problem.

"It is not an easy problem in many ways, but it is no harder than many others that have been solved, and there is reason to feel confident that the days of gasoline are numbered; at least for gasoline as the commonest automobile fuel. So many inventors are so near the kerosene carburetor that will do everything that can be done with gasoline that perfection cannot be far off. A little merging of patent interests, a little give and take between the inventors and a little really sympathetic interest on the part of motor car manufacturers are needed. Given these three things and the problem is solved.

"If the matter is not tackled promptly and squarely the European industries will steal another march on the American trade."

UNIVERSAL GIRL WILL BE OFFICIAL MASCOT DURING VANDERBILT CUP RACES

SANTA MONICA, Cal., Sept. 30.—Miss Lorna Avery, Universal Picture girl, has been selected official mascot for the 1916 Vanderbilt Cup and International Grand Prize races. Miss Avery is well known among automobile racing drivers and film folk and has many friends. The petite actress was selected from 15 other film favorites for her personal beauty and attractiveness.

CALIFORNIA NOW FIFTH IN MOTOR CAR REGISTERS

New York, Ohio, Illinois and Pennsylvania Lead Golden State in Cars

The following is the list of the number of motor cars registered by states, under date of August 1, 1916. Three states are missing, New Mexico, South Carolina and Texas.

Alabama	20,177
Arizona	10,588
Arkansas	16,509
California	197,872
Colorado	34,996
Connecticut	48,186
Delaware	6,200
District Columbia	43,000
Florida	13,671
Georgia	40,101
Idaho	11,905
Illinois	220,118
Indiana	119,949
Iowa	175,800
Kansas	89,223
Kentucky	26,526
Maine	24,702
Louisiana	14,227
Maryland	32,094
Massachusetts	114,270
Michigan	140,070
Minnesota	122,000
Mississippi	16,000
Missouri	97,000
Montana	21,250
Nebraska	86,100
Nevada	4,200
New Hampshire	15,480
New Jersey	84,519
New York	273,452
North Carolina	26,700
North Dakota	38,004
Ohio	225,000
Oklahoma	35,540
Oregon	30,496
Pennsylvania	200,251
Rhode Island	19,000
South Dakota	39,875
Tennessee	28,205
Utah	11,861
Vermont	13,286
Virginia	30,745
Washington	45,869
West Virginia	16,800
Wisconsin	104,400
Wyoming	6,400

2,981,970

MOTORISTS, TAKE HEED

Don't forget the horn is to be used as a warning. When blown, it tends to put the liability on the other fellow. Don't overload your car. It is yours. It cost you money. Why willfully chance breaking the springs and damaging the mechanism? Don't cross tracks, culverts, etc., straight. Drive across diagonally. It saves tires and makes riding easier.

RELATIONS OF CURRENT, PRESSURE, RESISTANCE IN SYSTEM EXPLAINED

(Continued from page 25)

ive pressure, and the direction of the effective pressure will correspond to the direction of the larger sum of pressures. For example, if six dry cells, each producing a pressure of 15 volts, are connected in series, but the pressure produced by two of them is in the opposite direction to the pressure produced by the remaining four cells, then the effective pressure in the circuit will be equal to the pressure produced by the four cells, or six volts, minus the pressure produced by the two cells, or three volts, which gives three volts. The same effective pressure could be produced by two cells acting alone, as the pressure produced by two of the six cells acting in one direction is exactly counteracted by the pressure of two of the six cells acting in the opposite direction.

Arrangement of Parts of Series Circuit

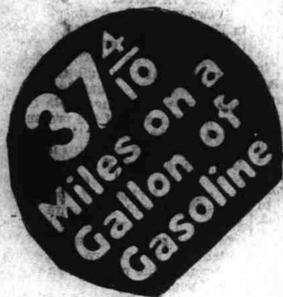
The order in which the various parts of a series circuit are arranged has nothing to do with the operation of the circuit. The pressures may be connected together at one point and the resistances all connected directly together, or the pressure may be distributed around the circuit by connecting the resistances between the different pressures. The effective pressure acting in the series circuit is independent of the location of the various pressures in the circuit and, likewise, the total resistance of the circuit is independent of the location of the different resistances forming the circuit. Two 10-volt lamps and two 6-volt batteries may be connected in series as shown in Figure 10, or they may be connected as shown in Figure 11, and the results are exactly the same.

If a voltmeter be connected between the points A and B in Figures 10 and 11 there will be no indication of

pressure between the two points, and so far as the operation of the circuit is concerned they may be connected together. The reason for there being no difference in pressure between the points A and B is as follows: The same part of the total pressure is used in operating each of the lamps, since they are supposed to have the same resistance, and, since the pressure produced by each of the batteries is the same, we can think of one of the batteries as producing the current in one of the lamps and the other battery as producing the current in the other lamp.

If the lamps were of unequal resistance in Figures 10 and 11 and the pressures produced by the batteries were the same, there would be a difference in pressure between the points A and B; or, if the resistance of the lamps were the same and the pressures produced by the batteries were equal, there would be a difference in pressure between the points A and B. If, however, the resistance of the lamps is equal and the pressures produced by the batteries are unequal, but the relation between the resistance is the same as the relation between the pressures produced by the batteries, then there will be zero pressure between the points A and B. If these points are so chosen that the lamp of higher resistance is in circuit with the battery of higher pressure between the two points.

Internal Resistance
Part of the pressure produced by a pump when it is causing the water to flow through a water circuit is used in causing the water to flow through the pump itself. The property of the pump which results in part of the pressure it produces being used in the above manner may be called the internal resistance of the pump. The great-



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