

USE OF FARM ENGINES

Both the Alcohol and Gasoline Type Described.

The determination of the position of the alcohol engine today involves a forecast of the future, and should it be shown to be able to compete now it must inevitably reach a stronger and more important industrial position as time goes on.

The efficiency of an alcohol engine may be assumed at this time to be unknown, but as alcohol can be burned in engines designed for gasoline, it may be assumed that such an engine will have with alcohol fuel the same thermal efficiency as with gasoline.

The first serious attempt to examine into the possibility of alcohol as a fuel in competition with petroleum seems to have been made in 1894 in Leipzig, Germany, by Professor Hartman. The engine used was built to operate on kerosene, and used 425 grams of kerosene per hour per brake horsepower, which is equivalent to 0.935 pounds, or 1.1 pints, approximately. This indicates for kerosene a thermal efficiency of 13.6 per cent.

When operating on alcohol the engine used about twice as much, or 839 grams, which with this kind of alcohol was equivalent to a thermal efficiency of 12.2 per cent., or a little less than with kerosene. The experiment would seem to indicate that, compared with kerosene, alcohol, as a fuel, offered very little chance for successful competition. In spite of this, investigations were continued and the results of this development may be summed up by stating that the thermal efficiency has been raised to something over thirty per cent.—quite a remarkable showing. In comparison with the original figure, this indicates that with a motor specially constructed for alcohol, the price per gallon might be twice as much as for the latter as for petroleum, and still produce power for less money, assuming all other conditions, such as cost of attendance, lubrication, etc., being the same.

The Office of Experiment Stations of this Department, in connection with its Irrigation and Drainage Investigations, has tested a number of different types of gasoline engines with alcohol and obtained figures which show the comparative consumption of gasoline and alcohol in the same engine. The first tests were made without any particular attempt at obtaining the best adjustment of the engine for each fuel, and showed a consumption of alcohol two or three times as great by weight per horsepower hour as was necessary with gasoline or kerosene. These figures indicate the necessity or desirability of determining the proper conditions of adjustment, because these were found to have a serious influence on the amount of fuel consumed. With care in adjusting the engine so as to secure the most economical use of the alcohol, it was found that, under like conditions, a

FIG. 1. SPECIAL VAPORIZER.

small engine consumed 1.23 pounds of alcohol to 0.69 pound of gasoline per brake horsepower hour—that is, with the best adjustment of the engine for each fuel there was required 1.8 times as much alcohol by weight as gasoline per brake horsepower hour. It was also shown in making this adjustment that it was possible

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to burn more than twice as much alcohol as stated by improper adjustments, and still have the engine working in an apparently satisfactory way. The range of excess gasoline which might be burned without interfering seriously with the working of the engine was not so great, being a little less than twice as much as the minimum.

There is on the American market a class of engines having a vaporizer which forms part of the cylinder head and which is heated by the explosions taking place inside the exploding chamber. One of these is shown in Fig. 1. On the figure, A is the vaporizer proper. Under it is seen a lamp (B), the burner an evaporizer being surrounded by a casing (D). This vaporizer is bolted to the cylinder head (E), and contains on its inner head a lip projecting into the exploding chamber. A little pump injects a small stream of oil at every stroke and drops it on this lip from the pipe (F). This lip is very hot from previous explosions and from the lamp, which is turned off when the engine begins work. The compression stroke forces the air in the cylinder over the lip and through the neck into the vaporizer bulb, thus mixing more or less completely the vapor which forms on the lip with the air that is forced over the lip into the bulb. Such hot-bulb vaporizers as this will work with practically all of the fuels—crude oils, gasoline, kerosene, and alcohol—with proper adjustments of the pump and of the temperature of the receiving bulb.

Another vaporizer of a similar order, but designed especially for alcohol, illustrated in Fig. 2, is known as the Brouhot, a French type. Exhaust gas enters at the bottom as shown by the arrow and lettering on the cut, and rises through the iron chamber, which is corrugated to increase the surface. Alcohol is admitted near the bottom of these ribs, and flows upward on the side oppo-

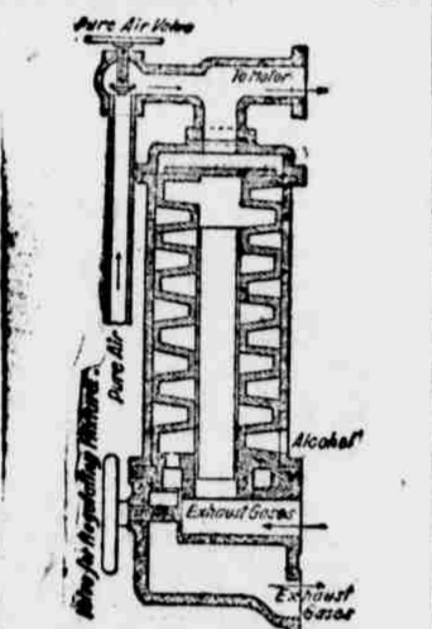


FIG. 2. BROUHOT TYPE.

site to that headed by the exhaust gases. The regulating valve is attached to permit some exhaust gases to pass around the heating chamber and so vary its temperature, but the regulation must be done by hand. Vapor rising from the surface of the alcohol in the top of the chamber meets air, which passes first through the regulating valve intended for the adjustment of proportions. The corrugations are such as to form a screw thread of a helix passage, and the exhaust entering first at the bottom, passes directly to the top of the cham-

ber and downward in the helical groove to the bottom, so that the top of the helix will be the hottest part. Alcohol enters the bottom of the opposite helix, flows upward and vaporizes somewhere in its upward course discharging into the air current at the hot top of the helix as superheated alcohol vapor. This vaporized is, therefore, of the boiling type, but the boiling takes place on the surface of the liquid which is at the pressure in the suction pipe and the rate of boiling is regulated by hand by admitting more or less exhaust gases to the vaporizing helix.

Should Live to 100 or 120 Years.

Is there a natural law which governs longevity in man or animal? There is a scientific law, which regulates and governs the normal round of human life. The law was discovered by Buffon, demonstrated by Vichat and made an exact science by Flourans. While the law has been frequently assailed it has never been overthrown, nor disturbed in its force. Animals increase in the direction of growth, bulk and virility; the duration of the time of growth determines the duration of life.

The law may be briefly stated thus: An animal grows as long as the bones are not united in their epiphyses. The duration of life is five times that of this growth. In man this growth ends at twenty; the bones are then united with their epiphyses, and the normal duration of life would be five times this, or one hundred. The growth of the camel ends at eight; according to the duration of life it should be forty. The growth of the horse ends at five, and his round of life should be twenty-five. The epiphyses of the bones of the ox ends at four; his round of life should be twenty. The lion, singularly enough, has the same duration of growth, and the same normal life as the ox. The dog reaches the end of growth at two and the round of life is ten; so that it is seen that the human life unless cut short by accident or disease, ends its round at from ninety to one hundred years; and that, whether a man be a negro, a Chinese, a European, an American, or whether he be savage or civilized; whether he be a dweller of the city, or in the country; that the veritable round does not depend upon race, climate, food, or other conditions. Mr. Flourans, who is perhaps the highest authority and who has studied it more in scientific details, is of the opinion "that every man has the power to fill this round, if he does not violate the natural law."

Vichat makes the round of life six times that of growth, instead of five times, which would make the round of life in man one hundred and twenty years. Other writers are of the opinion that the round should be extended to one hundred and fifty years, notably Dr. Compton, who going over similar ground, claims that this age has been occasionally reached in human life in various countries during the last two centuries.

Horses Slaughtered for Food.

Over 30,000 horses are annually slaughtered in Paris for food. The carcass of an average horse yields about 369 pounds of meat.

TRANSMIT SIGHT APPARATUS.

Telautophote Will Bring Distant Points in View.

In retentive minds will probably be recalled over an announcement of the invention of an instrument known as the telautophote, which is apparently designed to bring all remote parts of the earth into close touch by rendering distant and perhaps now invisible objects to view. The new mechanism, by electrical aid, it is said, would enable a New Yorker telephoning his wife in Chicago, to return home to study her expressions during the conversation. It would make a San Francisco prize fight or a Denver convention some day as visible from the Flatiron Building as a Fifth Avenue stage present, however, the telautophote will serve only as an attachment to the telephone, and its inventor, Mr. Sidney Rothchild, of No. 477 Eighth Avenue, New York, states that in this connection it will give complete satisfaction.

After two years of arduous work, spending hours every night at work on his invention, Mr. Rothchild, who is but twenty-six years old, proved his invention a theoretical success. He sent it to Washington, where it was approved and patented, and he is now working with models, to demonstrate the practicability of the device.

While Dr. Art. or Korn, of Munich, succeeded by the transmission of a photographic record, in conveying a distant likeness to view, it was not an instantaneous process like that of the telautophote.

Mr. Rothchild claims that his telephone method of transmission is much simpler than the negative printing method employed by Dr. Korn. It is founded upon the well known truth that when selenium is struck by light its electrical resistance changes in relation to the amount of light which shines upon it. The instruments employed in the sending and receipt of the electrical influence are of wonderfully simple workmanship.

The transmitting consists of a selenium coated cell, upon which any image may be focused by a camera lens through a transverse slot in a travelling steel belt. The belt moves perpendicularly across the face of the cell, which is made up of alternate copper and mica plates, insulated from each other, but connected along the edges at one side by a selenium coating. The intensity of the light reflected upon the cell will vary as the slot, travelling across the cell, exposes the coating to the lights and shades of the image.

The main cell is controlled by what is called a light control selenium cell, moving in proportion so much faster than the main cell that every point on the surface of the main cell is covered. The controlling cell thus transforms every point of light into an electrical impulse and sends it by wire to a distant receiving station.

At the receiving station is a belt, with perpendicular slots, rotating so that a pulley with horizontal slots passing it causes points of light to appear as one slot meets another. The light comes from a vacuum tube within the belt, and it varies in accord with the intensity of the electrical current from the sending station. Both receiving and sending apparatus work synchronously by regulated motors.

The light which appears at the slots varied at each point to the same degree with the light at the transmitting station, throws the figure seen at the transmitting station through a lens upon a ground glass screen. As the phenomenon of continuation of vision occurs in the moving picture, the varying figures on the screen, which appear as lighted by a single flash, present every movement of the object discerned.

Mr. Rothchild was born in New York and was a graduate of its public schools. He early undertook the study of electricity, building motors.

India's Valuable Coal Fields.

India, the land of mystery, is rapidly coming to the front in various fields of industry. The Indian empire possesses no fewer than 15 coal fields, while iron is worked on an extensive scale in no fewer than three districts, two of which are situated in the immediate vicinity of Calcutta. Nor are all fields wanting; 17 more or less important centers are engaged in this industry in the province of Bengal and Assam, while tobacco cultivation is another valuable asset.

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Clock Run by Radium.

A radium clock, which will keep time indefinitely, has been constructed by Harrison Martindale of England. The principle of this apparatus is simplicity itself, the registration of time being made in two-minute beats, while Weaver, the operator at the Louisville its function is to exhibit the dissipation of negatively-charged alpha and beta rays by radium.

The clock comprises a small tube, in which is placed a minute quantity of radium supported by a quartz rod. To the lower end of the tube, which is colored violet by the action of the radium, an electrocope formed of two long leaves or strips of silver is attached.

A charge of electricity in which there are no beta rays is transmitted through the activity of the radium into the leaves, and the latter thereby expand until they touch the sides of the vessel, connected to earth by wires, which instantly conduct the electric charge, and the leaves fall together.

This simple operation is repeated incessantly every two minutes until the radium is exhausted, which in this instance it is computed will occupy 30,000 years.—Scientific American.

Trees Growing in Churches.

The parish church of Ross, Herefordshire, possesses some singular ecclesiastical "ornaments" in two fine elm trees flourishing one on each side of the pew where once sat the famous "Man of Ross," John Kyrie. They are fabled locally to have sprung up as a token of Divine wrath against a profane rector of Ross who had cut down some trees which Kyrie had planted in the churchyard.

Trees in or on churches are not uncommon. At Kempsey, in the adjoining county of Worcester, a large horse chestnut tree has grown in the chancel from the tomb of Sir Edmund Wyld, who died about 1623. On the tower of Flahtoft Church near Boston grows a lusty beech, and a similar tree may be seen on the tower of Culmstock in Devonshire. Apart from intrinsic beauty the parish church of Crick, in Northamptonshire, is or was recently remarkable for two trees growing out of the masonry about fifty feet from the ground.—From the London Daily News.

Stewart's Way.

Alexander T. Stewart was the first "merchant prince." To-day we have my number of merchant princes, great kings, and if Stewart were alive he would find very lively competition. But he had some rules that might be copied by the merchants who have in some directions followed him. One of his rules was this: "Never praise an article; ask the customer what is desired and if you have it offer it without comment; name the price; if the customer is not pleased allow him or her to depart and make no comment; the article must stand on its own merits. It is the customer's privilege to buy or to decline to buy."

He is a Human Crazy Quilt.

S. H. Tweedell, a young man of Northport, Wash., who was scalded at the smelter several months ago, is beyond danger and rapidly recovering, but his body is a spectacle. Nearly three hundred skin patches, one to three inches, in length, were grafted on his body. Mr. Tweedell was caught in a lime bin and subjected to scalding steam for twenty-five minutes. The skin grafted on his body was given largely by his fellow workmen and his brother Walter.

Columbia & Montour El. Ry.

TIME TABLE IN EFFECT June 1 1904, and until further notice.

Cars leave Bloom for Espy, Almedia, Lime Ridge, Berwick and intermediate points as follows:
A. M. 5:00, 5:40, 6:20, 7:00, 7:40, 8:20, 9:00, 9:40, 10:20, 11:00, 11:40.
P. M. 12:20, 1:00, 1:40, 2:20, 3:00, 3:40, 4:20, 5:00, 5:40, 6:20, 7:00, 7:40, 8:20, 9:00, (9:40) 10:20 (11:00)
Leaving Bloom from Berwick one hour from time as given above, commencing at 6:00 a. m.
Leave Bloom for Catawissa A. M. 5:30, 6:15, 7:00, 7:40, 8:20, 9:00, 9:40, 10:20, 11:00, 11:40.
P. M. 1:00, 1:40, 2:20, 3:00, 3:40, 4:20, 5:00, 5:40, 6:20, 7:00, 7:40, 8:20, 9:00, 9:40, 10:20, 11:00, 11:40.
Cars returning from Catawissa 20 minutes from time as given above.
First car leaves Market Square for Berwick on Sundays at 7:00 a. m.
First car for Catawissa from Bloom 7:00 a. m.
First car from Berwick for Bloom Sundays leaves at 8:00 a. m.
First car leaves Catawissa Sundays at 7:30 a. m.
From Power House.
Saturday night only.
P. R. K. Connection.

Wm. Terwilliger, Superintendent.

Bloomsburg & Sullivan Railroad.

Taking Effect Feb'y 1st, 1905, 12:05 a. m.

Table with columns for NORTHWARD and SOUTHWARD, listing stations and times in A.M., P.M., and A.M. (A.M.) for various routes like Bloomsburg D & W., Bloomsburg P & C., Paper Mill, Light Street, Orangeville, Forks, Zanders, Stillwater, Benton, Edinboro, Cole Creek, Laubach, Cross Mere Park, Central, Jamison City.

Trains No. 21 and 22, mixed, second class. Daily except Sunday. Daily except Sunday only. Flag stop. W. C. SNYDER, Supt.

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State of Ohio, City of Toledo, Lucas County. Frank J. Cheney makes oath that he is senior partner of the firm of F. J. Cheney & Co., doing business in the City of Toledo, County and State aforesaid, and that said firm will pay the sum of ONE HUNDRED DOLLARS for each and every case of Catarrh that cannot be cured by the use of Hall's Catarrh Cure. FRANK J. CHENEY. Sworn to before me and subscribed in my presence, this 6th day of December, A. D. 1886. (SEAL.) A. W. GLEASON, Notary Public.

Large advertisement for Dr. Miles' Anti-Pain Pills for Headache, Neuralgia, Sciatica, Rheumatism, Backache, Pain in Chest, Distress in Stomach, Sleeplessness. Includes illustration of a hand holding a pill bottle.

Advertisement for Gasnow, If you have Headache Try One, They Relieve Pain Quickly, leaving no bad After-effects, 25 Doses 25 Cents, Never Sold in Bulk.