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THE BRAYTON READY MOTOR OR HYDROCARBON ENGINE.

Our engraving represents the Brayton hydrocarbon engine described by us not long ago as being in successful operation in this city. The distinguishing features of this engine are that it can be started in a very short time, that it is economical in its consumption of fuel, and that, owing to the constant maintenance of combustion, it is claimed, the danger of explosion of the hydrocarbon vapor is so greatly reduced as to be practically obviated.

The consumption of the crude petroleum used in this engine is stated to be five gallons per day for a five horse machine, the duty performed by a five horse engine in use being the grinding of 600 bushels of malt per day of ten hours. The ease with which the motor may be handled will be appreciated when we state that those run for our inspection were started, without any previous preparation, in one minute, the proprietors starting the engine themselves, not having an engineer in their employ. Another important feature of the motor is that the consumption of fuel ceases the instant the engine is stopped, the stoppage being effected by simply shutting off the supply of air.

In our engraving, A is the working cylinder of the engine, which is jacketed by a water cylinder. B is an air pump actuated by the working cylinder, and employed to compress air into the two reservoirs, C C, constituting the base of the frame. D is a pump which supplies the petroleum or other suitable fuel, as fast as it is needed for combustion. The action of the engine may be thus briefly stated: The oil pump feeds a few drops of liquid fuel through a small tube into an annular chamber containing felt; here the petroleum encounters a supply of compressed air by which it is vaporized;

the mingled air and vapor are forced in proper proportion into the working cylinder, where the combustion takes place, communication with the annular chamber being cut off and the products of combustion being left to work expansively, driving the working piston downwards or towards the end of the stroke; the compressed air supply to the working cylinder is cut off, thus extinguishing the combustion therein; the opening of the exhaust valve permits egress to the products of combustion, and the stroke is completed. An independent jet of hydrocarbon, burning continuously in a suitably provided chamber, lights the hydrocarbon in the working cylinder at the commencement of each stroke. The supplies of air and oil are, by very simple means, adjustable, thus giving to the engines all the advantages of a variable cut off, and thus effecting an important saving in fuel when the engine is not required to work up to its full capacity. Ordinarily but one of the reservoirs, C C, is employed, the other being kept charged in order to allow of the immediate starting of the engine at any desired time.

The engine is substantially built, the crank and the beam, and the central shaft upon which it works, being made of cast steel. The working or air piston may be removed, when

necessary for repairs, by simply disconnecting the connecting rod from the working beam; and by the removal of the bearing caps, the crank and the beam may be removed, leaving the engine stripped of its main parts, and giving access to any part which may need repair or renewal. The bearing and working surfaces are large in proportion to the amount of duty required of them, thus making the engine substantial and not subject to undue wear.

This motor is the invention of Mr. George B. Brayton, who has spent many years in its development and practical application. Sizes of three, five, and ten horse power are now built, and motors suitable for steam yachts and other special purposes are being designed. A one and a ten horse motor

ment is used with it again for a fresh observation. But a number of fresh neutral bars are kept always on hand to be employed in succession.

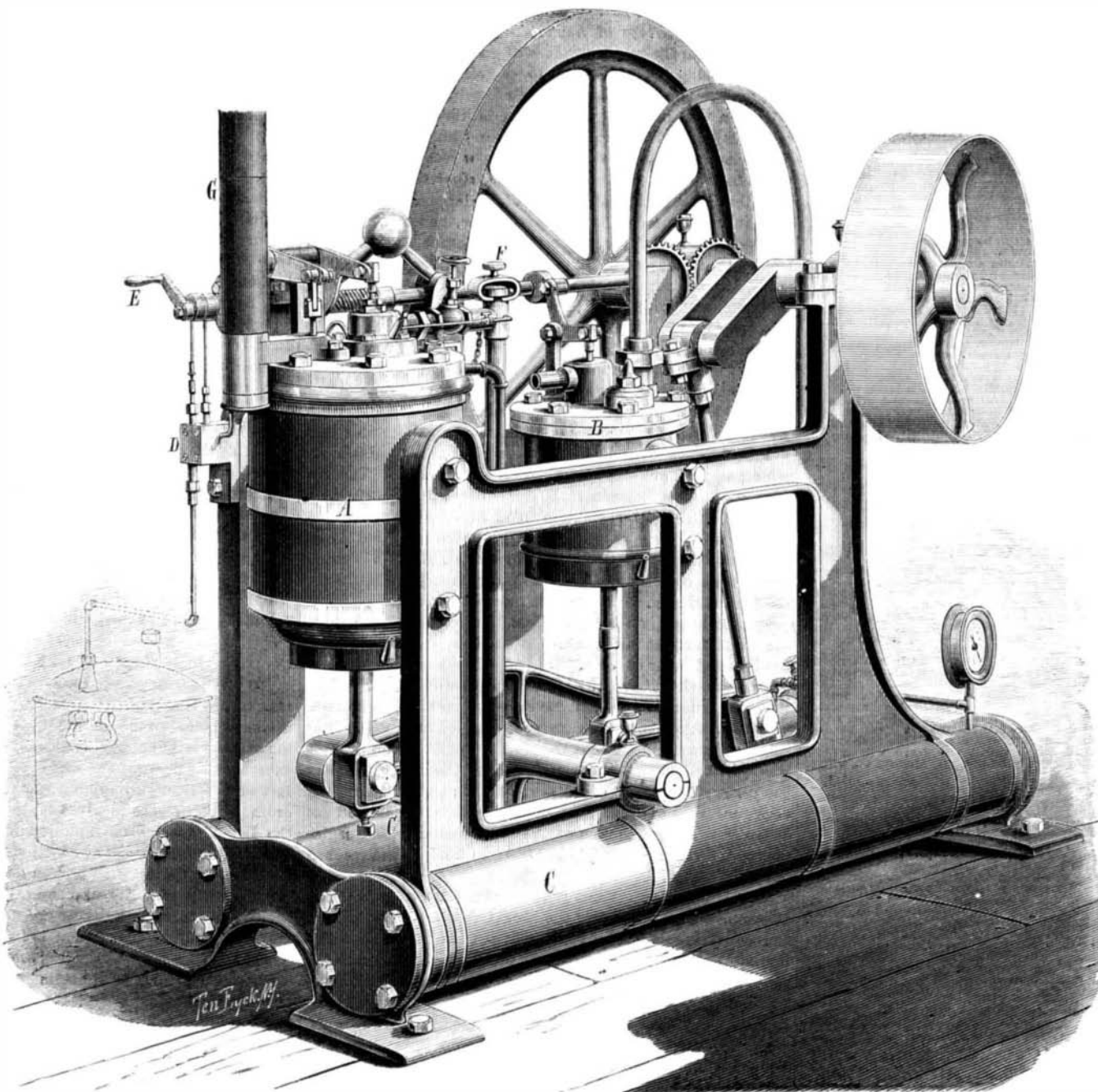
This instrument is very sensitive. A very slight spark from an artificial electrical machine, or even from an electro-phorus, suffices to give magnetism to the core, and to cause deflection on the traversing magnet. Its cost does not exceed \$2, and Professor Melsens is very sanguine that it will prove a useful instrument for an extended investigation of the changes and intensities of atmospheric electricity. The instrument is now used in the telegraphic offices of the Belgian lines, and formal official returns are made of the discharges which are indicated by it. The coil is placed

in continuation with the earth wires, which are provided for the protection of the instruments in the telegraph offices. Professor Melsens states that the magnetic needles in the offices furnished with the apparatus are deflected briskly by a lightning discharge, and that they are not infrequently recalled to zero, either briskly or gradually, by a subsequent discharge. Occasionally the deflection is reversed by the second discharge. Professor Melsens finds that ordinary commercial iron wire serves generally for the construction of the iron bars for the core. He has more difficulty in procuring iron that can be satisfactorily made neutral by heat than in finding iron that gives ready indications of the disturbance. He desires very much that this simple and cheap instrument should have an extended trial among telegraphists as a convenient means for investigating the movement, conditions, and rate of progress of atmospheric disturbances.

The instrument, which was lately shown at the Meteorological Society, will be included in the loan exhibition of scientific instruments about to be opened at South Kensington, London, England.

A Bi-Centennial Relic.

Professor Edward J. Young, of Harvard College, recently delivered an historical address at Sudbury, Mass., giving many incidents of much interest pertaining to the town, and particularly to King Philip's war and the battle fought at Green Hill. He referred to some relics in that town, one of which was described as follows: "The dwelling now owned by the venerable Mr. Willard Walker, which was built by his great-grandfather 200 years ago, and which has been in the possession of the family ever since, is almost entirely unchanged. There is one beam in this house measuring 12 by 14 inches. The building is covered on all sides with 4 inch plank or pitch pine, which is set up endwise and reaches to the roof, and is held on the inside by wooden pins. It is thus made bulletproof. The chimney, likewise, is immense, and has several enormous flues, while the fireplace was large enough to contain logs that were eight feet long. The windows were originally of diamond-shaped glass set in lead, but these have been removed. It is a relic which ought never to be destroyed. No money ought to be able to buy it."



THE BRAYTON HYDROCARBON ENGINE.

will be on exhibition at the Centennial Exposition. For information, address the Pennsylvania Ready Motor Company, 132 North 3d street, Philadelphia, Pa.

New Electrical Instrument.

This instrument is termed Marianani's *rhe électromètre*, and is intended for the investigation of electrical discharges between the atmosphere and earth. It consists essentially of a coil of copper wire turned round a pasteboard tube, and carrying a traversing magnetic needle mounted upon a vertical pivot immediately above the coil. The apparatus is so placed that the magnetic needle is ranged north and south by the earth's magnetism, and that the coil then crosses its axial line at right angles. A small iron bar is inserted as a core within the axis of the coil. Whenever a spark of electrical discharge of high tension passes through the coil, the internal iron bar becomes a magnet, and deflects the magnetic needle traversing above, the deflection of its north point being to the east or to the west, accordingly as the spark passes in one or the other direction through the coil. When the iron bar has been thus magnetized by a spark, it has to be deprived of its magnetism by heating before the instru-