used this apparatus for the past two and a half years with entire success in washing large amounts of gelatinous precipitates, working with as much as three pounds of precipitate in one funnel and washing with ten liters of water at one filling of the flask.

BUREAU OF PLANT INDUSTRY
U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

AN IMPROVED COMPENSATOR¹ FOR GAS ANALYSIS

By E. T. GREGG

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An improved compensator, described below, has been used with most satisfactory results in connection with the Hempel apparatus for gas analysis in the fuels efficiency laboratory of the Federal Bureau of Mines.

As shown in the accompanying drawing, two platinum wires are sealed into the compensator side of the mercury manometer. The upper wire which is sealed about $\frac{3}{8}$ in. above the mercury when level, is bent downwards at right angle and just touches the surface of the mercury. The lower platinum wire enters far enough to make electrical contact with the mercury. In series with the two platinum wires are a small dry cell, switch and miniature lamp.

To use the compensator for adjusting the volume of a gas before making a reading, the contact between the mercury and upper platinum wire is broken by means of the leveling bulb containing mercury, the switch is then closed and the compensator adjusted till the break in the circuit at the mercury platinum contact is just closed, whereupon the lamp lights and the compensation is completed. Rough adjustment is made by sliding the mercury bulb and its support upon the iron rod by hand. The fine adjustment is made by taking up the sag in the arm supporting the bulb by means of the thumb screw. The switch is then opened to prevent sparking at the mercury sur-

face when breaking the contact and to prevent deterioration of the battery. Compensation should always be made with a rising mercury column at point of contact.

In practice this compensator checks the gas volume consistently and accurately and does it in less time than the old optical method of adjusting the height

of the mercury to a mark. It removes the difficulty of adjustment due to poor or changing light and decreases the strain upon the eyes of the operator. Where many analyses are made it removes one of the chief sources of fatigue.

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¹ Pettersson, "O. Luftanalyse nach einem neuem Princip," *Z. anal. Chem.*, **25** (1886), 467; also Hempel's "Gas Analysis," translated by L. M. Dennis from 3rd German Edition, **1902**, 59.

ADDRESSES

ONE BILLION GALLONS OF SYNTHETIC GASOLINE IN 1918¹

By WALTER F. RITTMAN

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The market value of synthetic gasoline produced by cracking in the United States during 1917 will be sufficient to supply the navy with ten superdreadnaughts. In other words, one-fifth of the 3,000,000,000 gallons to be produced will be made by cracking.

By July 1 of the present year there will be in operation in the United States 4,000,000 automobiles. Financial men, in considering the investment value of motor stocks, have for several years been dwelling upon the saturation point, but despite this consideration the demand for machines still keeps well ahead of the 40 per cent average yearly increase of past years. When the saturation point will be reached nobody knows. Responsible and successful automobile men maintain that the present increase in rate of production will keep up for years, and that

¹ Paper read at the Spring Meeting of the American Chemical Society, Kansas City, April 10-14, 1917.

after the present high prices of materials the price of cars can be so reduced that every family having an income over \$1,000 may own a car. On this basis, the United States will have in the neighborhood of 10,000,000 automobiles, two and one-half times the present number. Assuming an annual life of five years per machine, 10,000,000 cars means an annual replacement number equal to 2,000,000; *i. e.*, our present rate of production. When one questions the correctness of the opinion of the automobile man who suggests the above figures, one is answered with the statement that every prediction which the automobile man has heretofore made has been too conservative. An important consideration is the greatly increasing number of motor trucks necessary to replace the shortage in horses. As to the influence on this industry of the United States' entrance into the European war, time will tell.

Only the steel, lumber, and clothing industries exceed the automobile business in importance today. Detroit, the center of this new industry, has risen as a manufacturing center from sixteenth place in 1900 to sixth place in 1914. In the United States over 500 factories are to-day engaged in making different