great deal of drilling has been going forward, and the productive districts remain as at the end of 1887, four in number; viz., the Berea grit, the Ohio shale, the Clinton limestone, and the Trenton limestone. The last-named stratum, which is both a gas and oil bearing rock in northern Ohio and central Indiana, is, excepting possibly the Bradford sand, the most important single source of petroleum and gas on this continent. The oil is still ranked as inferior, on account of the present difficulty of refining it; but there is no drawback to the gas, as is apparent from the following analyses, made for the United States Geological Survey: —

	Findlay.	Fostoria.	St. Mary's.
Hydrogen	1.64	1.89	1.74
Marsh-gas	93.35	92.84	93.85
Olefiant gas	.35	.20	.20
Carbonic oxide	.41	.55	.44
Carbonic acid	.25	.20	.23
Oxygen	.39	.35	.35
Nitrogen	3.41	3.82	2.98
Sulphuretted hydrogen	.20	.15	.21
Total	100.00	100.00	100.00

The small fraction, one-fifth of one per cent, of sulphuretted hydrogen is held to be decidedly advantageous, as it affords a certain means of detecting leaks.

No place within the natural-gas belt has derived greater advantages from this fuel-supply than Findlay, where in November, 1884, it was first found that the Trenton limestone, at some places at least, contained stores of high-pressure gas. Since January, 1886, the population of the town has increased from 6,000 to 30,000. Although there are rolling-mills, chain-works, machine and edge-tool shops, etc., the principal industry is glass, 155 pots being used by the ten firms engaged in making window-glass, fine flint ware, and bottles.

This growth has been built up in Findlay, as in other towns, by giving free, or nearly free, gas to manufacturers, — a gift which in some instances has been supplemented by land and contributions to capital, either from the town or parties interested in real estate. Under these circumstances, the question of the continuance of the supply is a vital one. Professor Orton has contended that the supply is a stored one, and notwithstanding the reasonableness of the theory, in view of the exhaustion of all deposits of liquid hydrocarbons, the gas has been used most profusely for the rough work of founderies, rolling-mills, brick and tile works, lime-burning, and the like, until, a short time since, Findlay found itself short of gas. A new well was drilled in, and, on being shot, responded with a pressure in the open casing of from 38 to 40 pounds, equivalent to a yield of about 30,000,000 cubic feet per day. The famous Karg well, which has been the main reliance of the town for the past two years, was estimated to discharge 12,000,000 cubic feet.

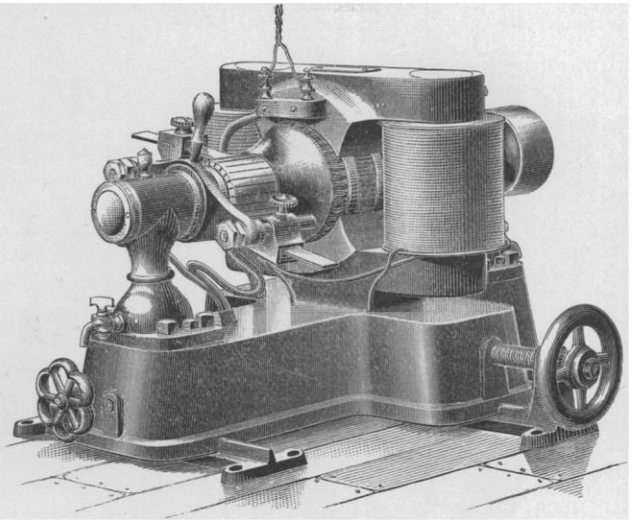
This shortage of gas has led to an investigation, from which the professor concludes that none of the large wells in the field have flowed three years, practically unrestrained, without giving unmistakable signs of nearing their limit. In some cases oil invades them; in others, salt water. The smaller wells appear in some instances to have a longer lease of life than the great wells. In some of the town wells the original rock pressure has been reduced by about three-eighths, but in others it is claimed it is fully maintained, only more time is required for gathering. The area exhausted by a vigorous well is not yet determined, but it is thought that the central portion of Findlay is partially drained of its original supply. As the city has pledged itself to furnish many million feet of gas each day, great energy and sagacity will be required to maintain in full vigor the splendid industries now established, and insure the continued prosperity of the town.

What is predicted of the Ohio Trenton limestone gas-field may probably be asserted as to the 2,000 square miles of the field in Indiana, though, if wells yielding 30,000,000 cubic feet of gas per day, equivalent to nearly 1,000 tons of coal, are to be found whenever a shortage occurs, there may be a longer lease of the industrial life of that region than a cursory reading of Professor Orton's article might lead one to infer.

THE DENISON MOTOR AND DYNAMO.

THE accompanying illustration shows the form of dynamo and motor now manufactured by Mr. J. F. Denison of New Haven, Conn. These machines do not differ in their construction much from that which experience has shown to be desirable, but the motors have some points worthy of special consideration.

An arrangement known as the Denison interlocking starting attachment is contained in the base of the machine, and is said to prevent any mistake in operating the motors. This attachment is



THE DENISON MOTOR AND DYNAMO.

so arranged that the current cannot be thrown on unless the resistance in the rheostat in the base is in the proper position. This is manipulated by a hand-wheel. In case of accidental breaking of the circuit, an automatic lock makes it impossible to turn the current on until the resistance is again in normal condition. The absence of attachments external to the machine, which are usually placed on the wall, the machine being entirely self-contained, does away with the expense of sending out special attendants to set it up. Further, as there are but two binding-posts, it is impossible to make a mistake in wiring.

HEALTH MATTERS.

Analysis of Foods.

THE commissioner of internal revenue of the United States has published the regulations concerning the analysis of foods and drugs in the District of Columbia. These regulations are based on the Act of Congress passed in 1888, entitled "An Act to prevent the Manufacture or Sale of Adulterated Food or Drugs in the District of Columbia." Section 12 of this Act provides that any health-officer, inspector of nuisances, or any food-inspector, may procure any sample of food or drug, and, if he suspects the same to have been sold to him contrary to any provision of the Act, he shall submit it to the commissioner of internal revenue to be analyzed. An offence shall be deemed to be committed in the case of drugs, if it differs from the standard of strength, quality, or purity laid down in the pharmacopœia, or falls below the professed standard under which it is sold. In the case of foods, the regulation gives a standard for butter, cheese, cocoa, chocolate, coffee, honey, lard, malt liquors, milk, mustard, olive-oil, oysters, pepper, tea, vinegar, wheaten flour, bread, and wine.

A large number of coloring-matters are prohibited for use in foods. Among these are aniline, gamboge, fuchsine, naphthol yel-