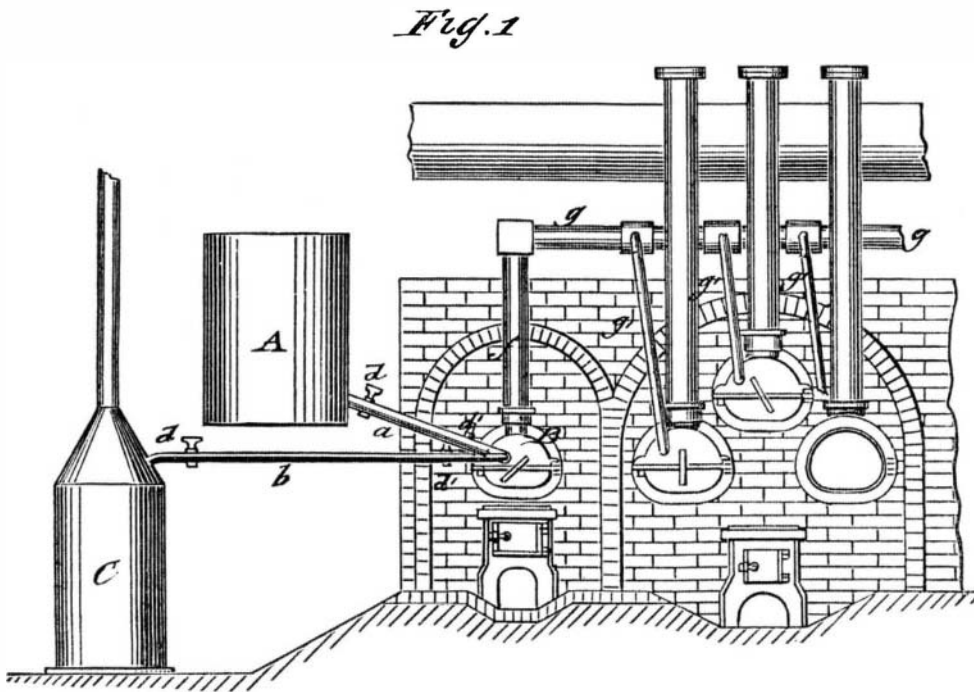


**MAKING GAS FROM PETROLEUM.**

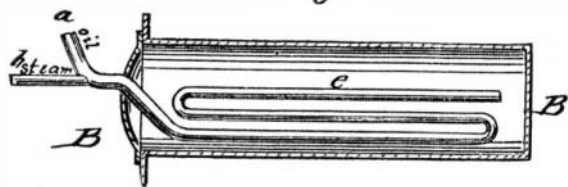
Mr. John McClarty, of Racine, Wis., treats petroleum or naphtha under the admission of steam in a preparatory retort, and conveys the semi-fixed gas produced therein by connecting pipes to the common retorts of gas benches, from which the thoroughly fixed gas is conveyed for further treatment, in the usual manner.

In the engraving, A is a small tank, to which the petroleum or naphtha is fed by a hand pump. The oil is conveyed by a pipe, *a*, to the first retort, B, made of cast iron, of round shape, and suitable width and length, and heated to a bright red previous to the admission of the oil. The nozzle of a steam pipe, *b*, is inserted about one and a half inches into the oil pipe, as shown in Fig. 3, for the purpose of imparting force to the oil. The steam is obtained from a boiler, C, and the inlet of oil and steam, in pipes *a* and *b*, is governed by valves, *d*. The oil and steam pass together to the inside of the retort, B, through a pipe, *e*, passing to the back end of the retort, then to the front, and finally to the back end again, as shown in Fig. 2, being discharged in a highly heated spray, and forming, by the heat of the retort, a semi-fixed gas. This gas then passes through the outlet pipe, *f*, to a bench-connecting pipe, *g*, and through drop pipes, *g'*, to the lids of the several retorts of the gas bench. The pipes, *g'*, enter the retorts, and extend to a point about twenty inches from the back end of the same, discharging there the gas, and converting it, by passing forward in the retorts to the stand pipes, into a thoroughly fixed gas. Each of the drop pipes, *g'*, on the benches is provided with a valve and union coupling, so that the flow of prepared gas into the retorts can be governed at pleasure.

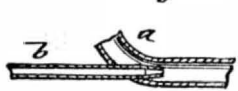


**McCLARTY'S METHOD OF MAKING GAS FROM PETROLEUM.**

*Fig. 2*



*Fig. 3*

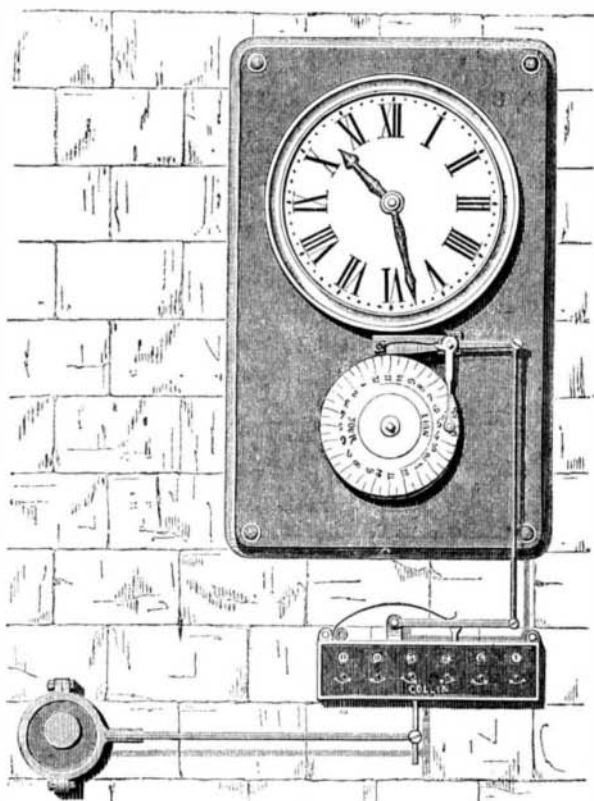


The retorts are fed subject to a pressure gage placed on the stand pipe of retort, B.

The inventor claims that, should the supply of petroleum fail, by accident or otherwise, no interruption of the works is necessary, as they can be instantly employed for the common coal process.

**NOVEL ENGINE COUNTER AND TELL-TALE.**

We extract from *La Nature* the annexed illustration of a new tell-tale for counting the strokes of an engine, indicating the speed, and also showing any variations in the work-



ing or stoppages of the machine. The mechanism, contained in the clock shown, causes the rotation of a disk placed below the clock face, on which disk a piece of paper, divided into divisions for 24 hours and fractions, is adjusted, the night hours being denoted by a line, drawn from 12 to 12, and nearer the center of the circle than the other marks. Above the disk is a lever which moves a pencil holder in front of the disk, and which receives motion from an arm which is connected with a counter. The latter is placed in

communication with the engine by the eccentric and rod shown. The construction is such that, when the engine has made 100 turns, a rod, extending through the upper side of the counter and connected with the pencil-moving mechanism, rises one tenth of its entire course, causing the pencil to make a mark parallel to the scale divisions. During the time elapsing before the completion of the suc-

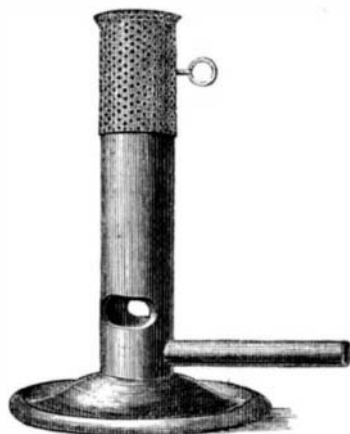
*Fig. 1*

ceeding hundred turns, the disk continues its rotation, so that the pencil, pressing against the paper, leaves a circular line. This is again broken by a cross mark of the pencil when the hundred turns are finished, and so on, until ten indications are made, showing that 1,000 turns have been accomplished. The rod in the counter has then completed its upward motion, and falls instantly back to its lowest position, causing the pencil to make a cross or nearly radial line ten times as long as that made to indicate the hundred turns.

It will be seen from this that the circular line, or rather that portion of it included between any two hundred turn marks, passing as it does over the time divisions inscribed on the paper, shows exactly how long a period was occupied by the engine in making the above number of rotations. By comparing these sections of the line together, the fact of all being exactly the same length shows the regularity of the machine, while the stoppage or irregularity of the same will at once be indicated by the circular line continuing unbroken. The length of the line between the 100 turn divisions also shows the speed of the engine; and the same may, besides, be used to indicate whether or not the machine was started or stopped according to orders at any predetermined hours. The interior mechanism is securely inclosed in locked cases, so as not to be accessible to the engineer.

**A SOLID FLAME BUNSEN BURNER.**

The accompanying engraving represents a new form of Bunsen's burner, described in a paper recently read by Mr. John Wallace before the Newcastle-on Tyne Chemical Society. Its chief peculiarity is an adjustable cap of perforated metallic plate, which enables it to burn a much more in-



flammable mixture of air and gas than is possible with the ordinary burner. The tendency to light within is also completely prevented, whatever may be the pressure, quality, or quantity of gas passing. By raising the cap to the necessary height a perfectly solid flame is obtained—a novel and valuable feature, since it allows any substance to be heated to be put much nearer than usual to the center of the flame without interfering with combustion. It can be made from one inch to two inches in diameter, and is capable of burning as much as 40 cubic feet of gas per hour.

**Origin of Atmospheric Electricity.**

According to M Becquerel, solar spots, which are sometimes 16,000 leagues in extent, appear to be cavities by which hydrogen and various substances escape from the sun's photosphere. But hydrogen, which appears here to be only the result of decomposition, takes with it positive electricity, which spreads into planetary space even to the earth's atmosphere and to the earth itself, always diminishing in in-

tensity because of the bad conducting power of the successive denser layers of air and of the crust of the earth. That would then only be negative, as being less positive than the air. The diffusion of electricity through planetary space would be limited by the diffusion of matter, since it cannot spread in a vacuum.

That gaseous matter extends further through space than the distance which is generally assigned to the earth's atmosphere will be proved by the fact that auroras, which are due to electric discharges, are produced at heights of 100,000 and 200,000 yards, where some gaseous matter must exist.

M. De la Rive agrees with M. Bécquerel as to the electrical origin of the aurora, but considers that the earth is charged with negative electricity, and is the source of the positive atmospheric electricity, the atmosphere becoming charged by the aqueous vapor rising in tropical seas. The action of the sun, he considers, is an indirect action which varies with the state of the sun's surface, as shown by the coincidence in the periods of aurora and sun spots.

In the accounts of travelers in Norway, we often read of their being enveloped in the aurora, and perceiving a strong smell of sulphur, which must be attributed to the presence of ozone. M. Paul Rollier, the aeronaut, who descended on a mountain in Norway 4,328 feet high, saw brilliant rays of aurora across a thin mist which glowed with a remarkable light. To his astonishment an incomprehensible muttering

caught his ear; when this ceased he perceived a very strong smell of sulphur, almost suffocating him.—*Manual of the Natural History, Geology, and Physics of Greenland.*

**LLOYD'S FLOATING APPARATUS.**

Mr. Lloyd's apparatus has claims which are worthy of far more consideration than those of the Boyton dress. First perhaps in utility is an air mattress of the ordinary shape, which is inflated in three compartments, and by the aid of which Mr. Lloyd lately crossed the Solent. This mattress, says *The Field*, is available as an ordinary bed, either on board ship or under canvas. "With the middle compartment empty, Mr. Lloyd showed us that its buoyant powers are sufficient to enable him to jump into the water without sinking below his armpits, while it affords protection from mechanical injury by wreck or rock. After entering the water in this way, he inflates the middle compartment, and it then forms a raft, which he is able to propel with the paddle at the rate of between two and three miles an hour. Emigrants may therefore, without any extra outfit, provide themselves at the above rate with a floating apparatus which may be propelled to shore from a wreck. Another useful means of flotation is his swimming waistcoat, by the aid of which a bather can float without the possibility of its shifting. is unsightly, no doubt, but this ought not to weigh against its utility in avoiding the risk of sinking when learning to swim. Its price is only \$3.75, gold."

The most noteworthy, however, of Mr. Lloyd's inventions is his canoe, which can be folded into the compass of a small



portmanteau or carpet bag when empty. It is made in two divisions, buckled firmly round the waist after inflation, and kept in position by a strap passing between the legs from the front to the back. A waterproof dress is first drawn on made of the ordinary twilled material used for coats, etc and buckled over the shoulders, with the arms quite free. Having first encased himself in this way, Mr. Lloyd jumped into the water, and, with his paddle in his hands, sinking only to the level of his armpits, easily paddled with the tide at the rate of 3 miles an hour.