

Science and Art.

Galvanic Gas Igniter.

To turn the stop cocks successively of a large number of gas burners, and apply a match or torch to ignite the jet, is a work which requires considerable time. In some situations, as in public halls and the like, the act of igniting the gas in this manner so far distracts the attention of an audience that it is impracticable to light the house while a meeting is in session, and it has consequently been considered necessary either to light the gas a long time before hand in the broad sunlight, or to adjourn at dusk. In many places, such as among the scenery of theatres, a large share of the risk of fire is due to the lighting of the gas with torches.

The object of the invention here illustrated is to provide means of not only igniting, but of turning on or shutting off the gas, by the galvanic current. The igniting is performed by the direct or rather by the calorific effect of a current, and the turning of the cock by the electro-magnetic action of a current from the same or a different battery conveyed through another set of wires.

When a powerful current is carried through a wire which is, either from its small size or the nature of the metal, not a very good conductor, such wire becomes very much heated. The amount of heat developed in passing any obstacle depends on the "quantity" of the current or on the size of the cups or plates employed, but the ability of the current to pass through a long wire under such circumstances, or through a considerable number of such, depends on the "intensity" of the current, or the number of pairs or cups employed. The temperature required to ignite gas is generally at or below a red heat, and to light a jet by this means it is simply necessary to locate a small wire, or better, a small coil of the same in the stream of issuing gas and connect the wires. In order that the wires may endure the continued heat it is necessary that they be of precious metal, and in practice platina is adopted on account of its ability to withstand a very intense heat and consequently a very powerful current without fusion.

In the engraving, L represents the coil of platina wire (No. 10 diamond gage=No. 30 ordinary steel gage) soldered to the ends of the stouter copper wires represented on each side of the burner. The wires lead down to the keys, H h, which may be many rods or even miles distant if necessary, and by depressing or releasing h, the circuit is made or broken at will.

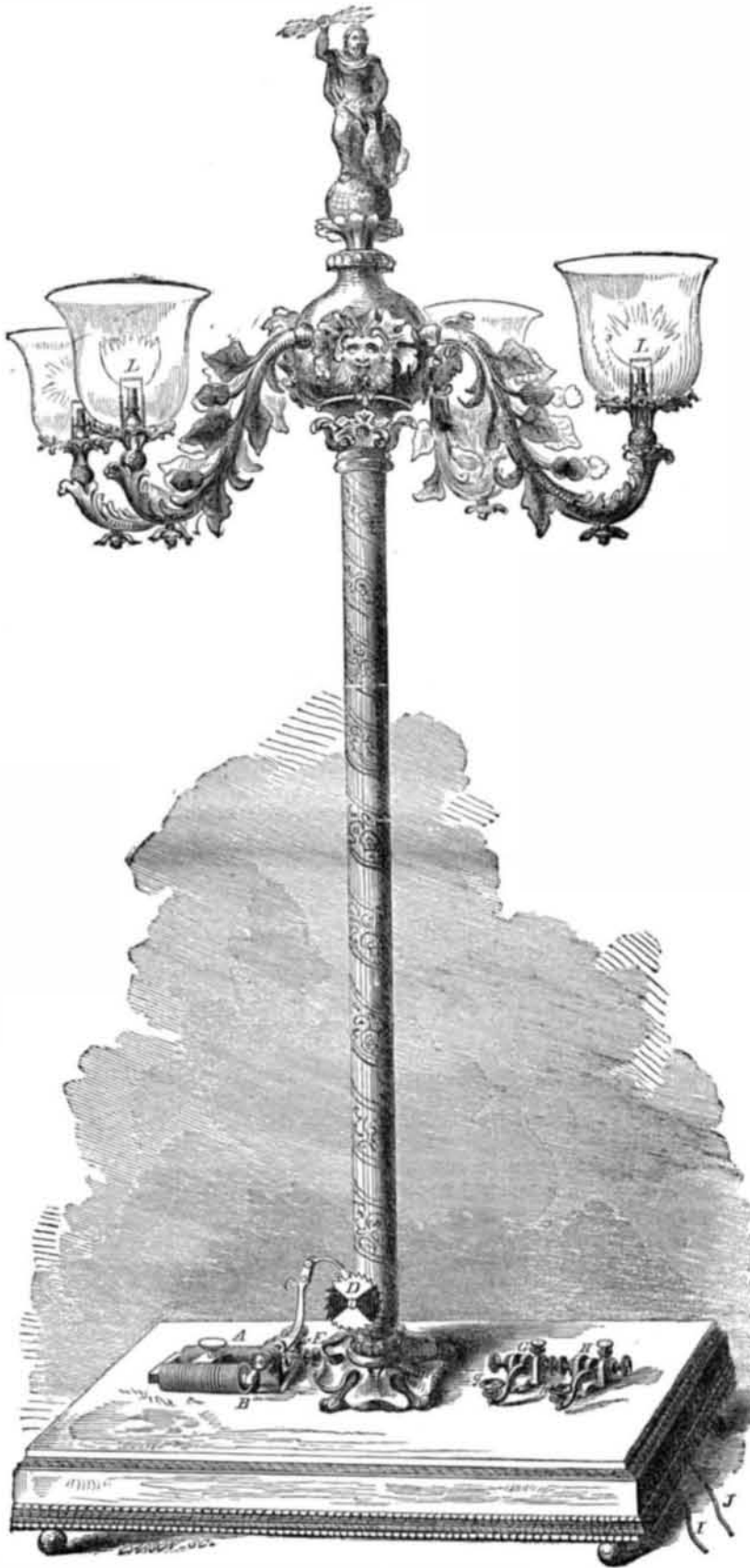
A represents two helices, within which are soft iron bars which become electro-magnets, while the current is flowing through the helices. B represents an armature, or keeper, also of soft iron, mounted on the short arm of the lever C, the whole being arranged and connected to the keys, G g, in the same manner as in telegraph operations, so that whenever the key, g, is depressed, the circuit is completed, the iron becomes magnetic and attracts the keeper, giving motion to the lever, C; and as often as the key, g, is released, the circuit is broken, the magnetism is lost, and the parts resume their original positions by the action of a gentle spring. The analogy only fails at the end of the lever, C, where, instead of a pencil or marking point, is mounted the pawl represented, which at each vibration of the lever, or each movement of the key, turns the ratchet wheel, D, one notch. D is fixed on the plug of an ordinary cock, which controls the flow of gas to the burners, and by working the key, G, the cock may thus be slowly turned continuously around in one direction, giving alternately periods of light and darkness. To aid the operator in manipulating the single but very tastily designed group of burners represented in the engraving, the ratchet wheel, D, is made in alternate dark and white sections, as represented. When the pawl works on the white, the cock is open and gas is flowing, but by depressing g twice, it shuts. By depressing it four times more, it begins again to flow, so that by properly manipulating the key, g, the gas may be shut off or let on at pleasure. I

and J represent the wires connecting the keys with the battery beneath.

The inventor of this ingenious apparatus is Mr. Samuel Gardiner, Jr., of this city. Application for Letters Patent of the United States is now pending, and British and French patents have already been obtained through this office. It has been, as noticed last week, successfully introduced in the Broadway theater, in this city, and arrangements are being made for introducing it in one of the principal theatres in Philadelphia. The apparatus, as applied

in these situations, is only employed to ignite the gas, the letting on and shutting off the same being done by hand in the ordinary manner by cocks in the prompter's box. The current is applied to one chandelier at a time, coils on the burners of which become instantly heated, and the gas jets follow each other rapidly in igniting, after which the current is turned upon another group of burners. It requires but about thirty seconds to light all the chandeliers in the whole house by this means, an operation

GARDINER'S GALVANIC GAS IGNITER.



which, as ordinarily conducted, occupies two men an hour. As a means of showing its power, it is customary to shut off and again ignite the gas between each act. The battery employed is Smee's, thirty cups being employed, each of one gallon capacity.

As indicative of the increased safety of this apparatus, we learn that one of the insurance companies has offered to insure theatres for 25 per cent less premium where this apparatus is employed. In all large buildings, the gas saved by being able to light in so short a time when desired, is certainly a very important item. Another point worthy of notice is, that the coil, being always kept heated by the flame, retains heat enough for several seconds without aid from the battery, to ignite a jet when it chances to be extinguished by

any sudden puff of wind, a very important consideration in street lighting. There are reasons to suppose from the experiments of the inventor, that it is perfectly practicable to light by this process all the burners in a mile of street.

For further information, inquiries may be addressed to Mr. Samuel Gardiner Jr., 167 Broadway, New York.

The Comet.

The predicted comet of D'Arrest is now visible in the northwestern part of the heavens, near Ursa Major. The assertion of a French astronomer that this comet would strike the earth, seems to have met with general skepticism. "It is useless to speculate," says Professor Mitchell, "in reference to the

possible consequences of a collision with a comet, as there is scarcely one chance in millions that it can occur. Science has yet discovered no guarantee for a planet against the possible shock of a comet, but an examination of the delicate adjustments of our own system and those of Saturn and Jupiter, would seem to indicate that in all past time no derangement has ever occurred from such a cause."

It was only last week that the Erie Canal was in a fit state for the navigation of the present season. This has been the latest and coldest spring within the recollection of the oldest inhabitant.

Insurance of ships was first practised in the reign of Cæsar, in A.D. 45. It was a general custom in Europe in 1194. Insurance offices were first established in London in 1667.

Literary Notices.

THE MAGIC STAFF; AUTOBIOGRAPHY OF ANDREW JACKSON DAVIS.—A. J. Davis, "the seer," as he is called, has now given to the world his own history, which is written in a style very interesting to many persons; it does not possess that nervous force, however, which we like, but is very diffuse. It is not a simple, clear narrative, but written in that style of philosophy so common with those called "spiritualists." There is one thing we admire in this volume, however, that is the kind and amiable spirit which permeates through the whole of it. Published by J. S. Brown & Co., Frankfurt st., this city.

ILLINOIS AS WE IS.—This is the title of a most useful and interesting volume by Fred. Gerhard, of this city. It contains a brief sketch of the early colonies, and a very full history of the "Prairie State," as it is called. The natural resources, products, geological characteristics, the progress in agriculture, in short, everything relating to Illinois appears to be described in this work. It contains a map of the prairies, woods, and bluffs in the State; also a geological map, which shows that it possesses the most extraordinary deposits of lead and coal in the world—in fact, three-fourths of the entire State is a coal field. For sale by Fowler & Wells, 308 Broadway, this city.

IMPERIAL ENCYCLOPEDIA OF MACHINERY.—Paris 7 and 8 of this great work, published by Russell & Bros., Tremont st., Boston, are now ready. They contain drawings of an improved Jacquard loom, a new disk engine, erected at the Times office, London, and a short stroke reciprocating engine, for screw propulsion. This is an admirable and comprehensive work on machinery.



Inventors, and Manufacturers

TWELFTH YEAR.

PROSPECTUS OF THE SCIENTIFIC AMERICAN.

This work differs materially from other publications being an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanical and Chemical Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Mill-work, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

The SCIENTIFIC AMERICAN is printed once a week, in convenient quarto form for binding, and presents an elegant typographical appearance. Every number contains Eight Large Pages, of reading, abundantly illustrated with ORIGINAL ENGRAVINGS—all of them engraved expressly for this publication.

All the most valuable patented discoveries are delineated and described in its issues, so that, as respects inventions, it may be justly regarded as an ILLUSTRATED REPERTORY, where the inventor may learn what has been done before him, and where he may bring to the world a KNOWLEDGE of his own achievements.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and People of every Profession in Life, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings.

REPORTS OF U. S. PATENTS granted are also published every week, including Official Copies of all the PATENT CLAIMS. These Claims are published in the SCIENTIFIC AMERICAN in advance of all other papers.

Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them continual source of knowledge, the experience of which is beyond pecuniary estimate.

Much might be added in this Prospectus, to prove that the SCIENTIFIC AMERICAN is a publication which every Inventor, Mechanic, Artisan, and Engineer in the United States should patronize; but the publication is so thoroughly known throughout the country that we refrain from occupying further space.

TERMS OF SUBSCRIPTION—\$2 a year, or \$1 for six months

CLUB RATES.

Five Copies for Six Months,	\$4
Five Copies for Twelve Months,	\$8
Ten Copies for Six Months,	\$8
Ten Copies for Twelve Months,	\$15
Fifteen Copies for Twelve Months,	\$22
Twenty Copies for Twelve Months,	\$28

For all Clubs of 20 and over, the yearly subscription is only \$1.40.

Post-pay all letters and direct to

MUNN & CO.,
126 Fulton street, New York.