

**MAXIM'S NEW GAS MACHINE.**

[Continued from first page.]

escape through the jet, L. This produces a partial vacuum at L, and draws air in at C. The air and steam pass with great rapidity through the tube, G. The action of the air and steam produces another partial vacuum at N, which draws gasoline in through the pipe, B. The adjustment of the opening is such that one pound of steam draws in air sufficient for two pounds of gasoline. The heat of the steam is taken up by the refrigeration caused by the evaporation of the gasoline, so that at E the compound is carbureted air and cold water. The tube, F, presents the curious phenomenon of being hot at *a* and cold at *b*. In one short piece of tube we have a hot retort and a cold condenser. The supply of gasoline is regulated by the valve, D. The dash pot, H, prevents a too rapid action of the valve, I. Gas of any desired density may be made, and when once adjusted the gas does not vary. The burner used with this machine is made to produce the very best results attainable, and then the gas is regulated to a density and pressure to suit the burner. The nuisance of an adjustable burner is thus obviated.

The holder closes off the supply when full, and lets on a supply when nearly empty. Gasoline has been much improved within a few years. It is now so very cheap that the equivalent of one thousand feet of coal gas of standard quality may be equalled for sixty cents. Where no steam is at hand these machines are run with a small oil burner. They are being made by the Pennsylvania Globe Gas Light Co., 131 Arch St., Philadelphia, Pa., of from 100 to 10,000 burner power. This machine was patented June 8, 1880.

**PREVENTION OF BOILER EXPLOSIONS.**

This vexed problem has occupied the minds of engineers and inventors since the introduction of steam as a motive power, and there are several theories of boiler explosions, each having its adherents. Of course there are conditions under which a boiler explosion is involved in no mystery; as, for example, when the water is dangerously low, when the safety valve is of insufficient capacity, or when it is unduly loaded; but there are other cases where an explosion cannot be rationally explained in the light of the well known theories.

Mr. Daniel T. Lawson, of Wellsville, Ohio, has recently patented, in this and several other countries, a device for preventing boiler explosions, which appears practical, and according to the testimony of scientific men the claims of the inventor are well founded.

The inventor, in explaining his invention, says that when water is superheated it becomes as explosive as gunpowder, exploding by bursting into steam from a reduction of pressure. When the engineer opens the throttle valve the cylinder is instantly filled with steam, creating a vacuum to that extent in the boiler. The superheated water then immediately rises to fill the vacuum, and is met by the valve, instantly cutting off the escape into the cylinder; this causes a concussion on every square inch in the boiler much greater than the regular pressure of the steam. There is abundant reason to believe that it is

this concussive action which causes the numerous and mysterious boiler explosions, and which cause is wholly independent of the amount of water in the boiler; in fact, the greater the amount of water in the boiler the more terrific the explosion.

This invention, which is based upon this theory, consists in reducing the concussive strain produced by the impulsive and intermittent escape of steam to the cylinders to an approximately uniform pressure, by rendering the evolution or passage of steam from the water to the steam space approximately constant and independent of the intermittent discharges from the steam space to the cylinder. The means for accomplishing this consist in a boiler constructed with a partition, A, intervening between the water space and the space from which the steam is taken to supply the cylinder, and feeding the steam as it is generated through valves or

moved from the water immediately under it, consequently the water rises through the valve. A number of small openings for the liberation of steam from the superheated water will remedy this difficulty.

**MISCELLANEOUS INVENTIONS.**

Mr. Niels C. Larsen, of Sacramento, Cal., has patented a purse or satchel fastening which can be securely locked and present a smooth and unbroken surface without projections.

A combined dental speculum and shield has been patented by Mr. Alfred W. Edwards, of New York city. The object of this invention is to facilitate the performance of dental operations, such as the filling of teeth. It consists in a combined dental speculum, gag, and shield formed of a flaring or bonnet-shaped shell of metal, having a longitudinal slot in its lower side to receive the teeth, and an arched wire attached to its lower part, upon the opposite sides of the slot, to rest upon the teeth and support the forward part of the shell.

An improved coupling for the shafts of a wagon, which can be readily fastened to or unfastened from the axle, has been patented by Mr. William W. French, of Stockbridge, Mass. The invention consists in the combination with the axle clip and knuckle joint of a sliding bearer and spring catch to facilitate the opening and closing of the coupling.

Mr. Joseph Kintz, of West Meriden, Conn., has patented an improved process for bronzing iron surfaces, which consists in cleaning and buffing the iron surfaces, then electro-

plating with copper, then dipping in acid solution, then again buffing, then boiling in a salt of tin solution, and then finishing by subjecting the article to heat until the copper and spelter coatings are fused into bronze.

A simple device for extending the steps of passenger cars, for the convenience of passengers getting in and out of the car, and for protecting at the same time the treads of the permanent steps from sparks, cinders, snow, etc., during the passage of the car from one station to another, has been patented by Mr. Benjamin F. Shelabarger, of Hannibal, Mo.

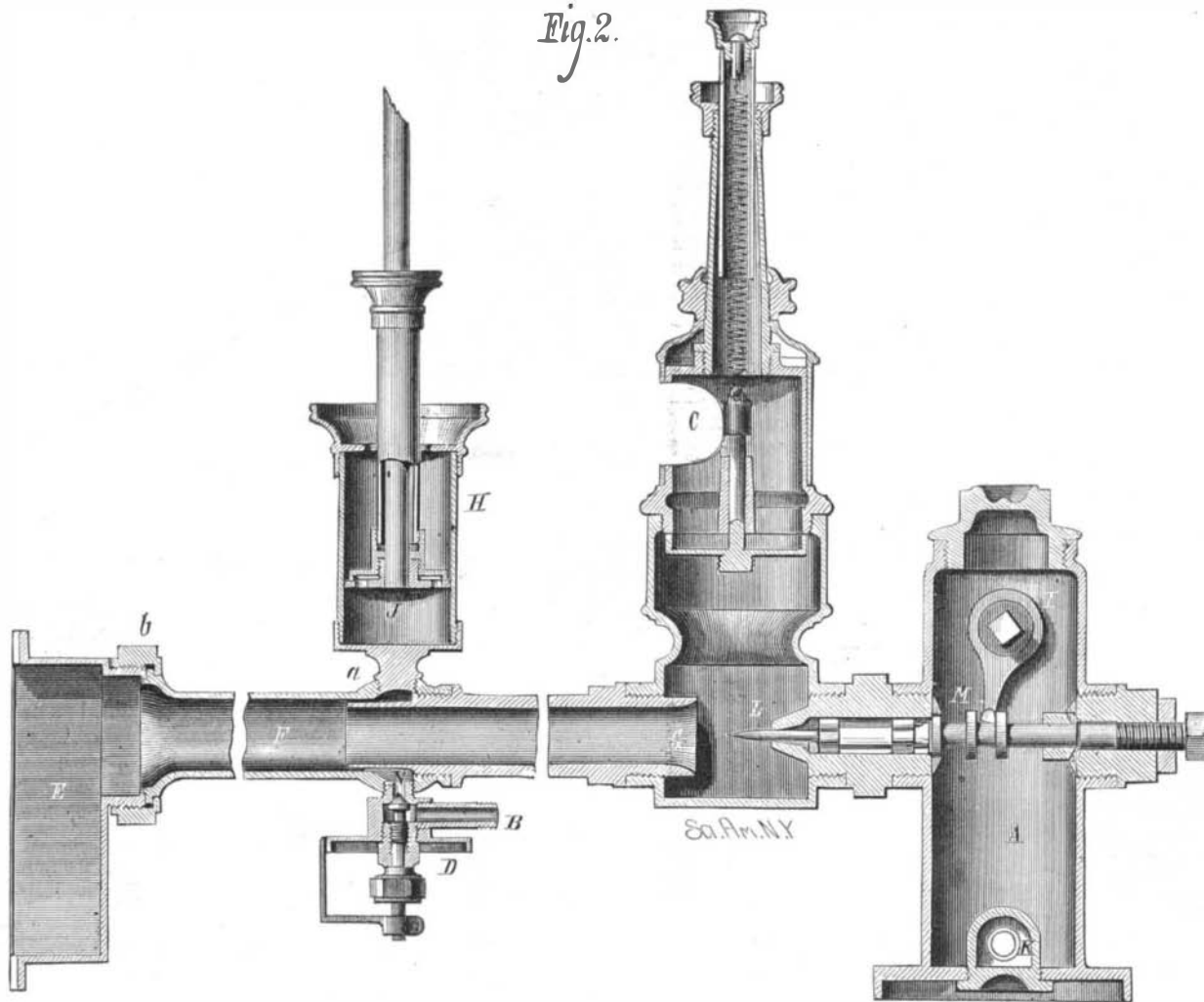
Mr. Luther C. Baldwin, of Manchester, N. H., has patented a new and improved automatic heat regulator, simple in construction and so arranged as to operate, under the smallest changes of temperature, upon the valves of the source of heat.

An improved cigar lighting stand has been patented by Mr. Joseph Kintz, of West Meriden, Conn. This improvement relates to lamp stands for cigar lighting, and has for its object the production of a stand of ornamental character which may be packed closely for transportation and readily put together for use.

A simple, safe, and efficient device in which light oils may be used as fuel for heating sad irons for domestic use, or for the use of tailors, dress-makers, etc., has been patented by Mr. Harvey L. Wells, of Evansville, Ind. It consists essentially of an iron box divided longitudinally into two chambers, the lower being the combustion chamber and the upper the heating chamber.

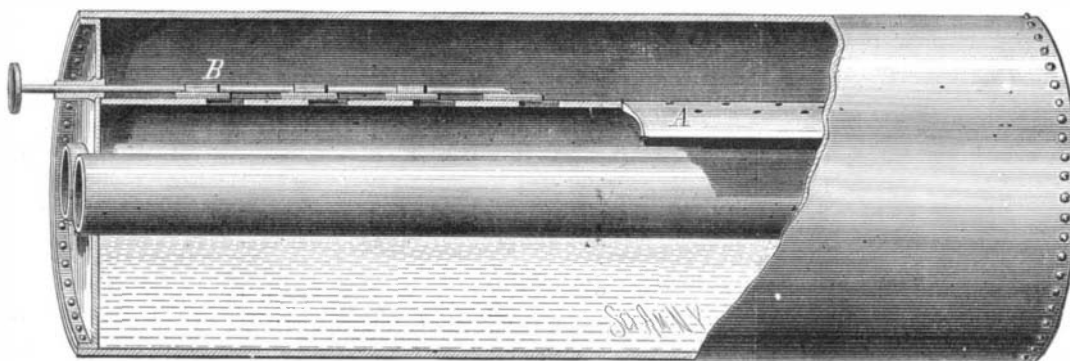
An improvement in electric light has been patented by Mr. Charles J. Van Depoele, of Detroit, Mich. The object of

this invention is to automatically regulate the feed of the carbon in electric lights according to the changes of resistance in the current caused by the consumption of the carbon points, so as to prevent flickering and variations in intensity of the light.

**MAXIM'S GAS MACHINE—SECTION OF INJECTOR.**

orifices, B, in the partition, of a smaller size than the port or opening through which the steam passes into the cylinder. By this means the normal steam pressure or steam supply, when thus intermittently or alternately reduced, is restored gradually by reducing the flow from the water space to the steam space, so that the transformation of water into steam is made approximately uniform in spite of the intermittent escape of steam through the cylinders, and the boiler is thus relieved of the constant wear and strain of the concussion.

In supplying steam from the water compartment to the steam compartment, the inventor intends using a number of small perforations, not amounting in the aggregate to more than about one twentieth the size of the cylinder port, in connection with a number of small valves to be under control of the engineer, so that the amount of steam required can be readily regulated, yet carefully avoiding the possibility of all, when opened to their utmost capacity, forming as large an opening as the valve through which the cylinder is supplied. A number of small valves and perforations in

**LAWSON'S IMPROVED STEAM BOILER.**

the partition sheet between the water and steam compartments, will remedy that hitherto very general annoyance of water rising to and through the valves, which is occasioned by pressure of steam upon the surface of the water, and when one large valve is opened, the pressure is partly re-

**Chloroforming during Sleep.**

The possibility of chloroforming a person in sleep, without waking him, having been disputed in a recent murder trial, Dr. J. V. Quimby, of Jersey City, was led to test the question experimentally. The results were presented in a paper before the section of medical jurisprudence at the meeting of the American Medical Association a few days ago. Dr. Quimby made arrangements with a gentleman to enter his room when he was asleep and apply chloroform to him. He did this with entire success, transferring the person from natural to artificial sleep without arousing him. He used about three drachms of Squibb's chloroform, and occupied about seven minutes in the operation. The second case was a boy of thirteen who had refused to take ether for a minor operation. Dr. Quimby advised the mother to give the boy a light supper and put him to bed. She did so, and Dr. Quimby, calling when the boy was asleep, administered the chloroform and performed the operation without awakening the boy. The third case was a boy of ten years suffering from an abscess, and the same course was pursued with equal success. Two important inferences may be drawn from these cases, Dr. Quimby said. Minor surgical operations may be done with perfect safety and much more pleasantly than in the ordinary way, and, secondly, a person somewhat skilled in the use of chloroform may enter a sleeping apartment and administer chloroform with evil intentions while a person is asleep. Hence the use of this drug in the hands of a criminal may become an effective instrument in the accomplishment of his nefarious designs.

**IMPROVED WATERING DIPPER.**

A convenient vessel for watering plants, sprinkling floors, and for other similar purposes is shown in the annexed engraving. It is simply a dipper of the usual form, partly covered at the top by a shield, at the center of which is fixed a sprinkler spout. The utility of this improvement will be



**HARRISON'S WATERING DIPPER.**

recognized without further description. It was recently patented by Mr. R. Harrison, of Columbus, Miss.

**IMPROVED ELECTRIC LAMP.**

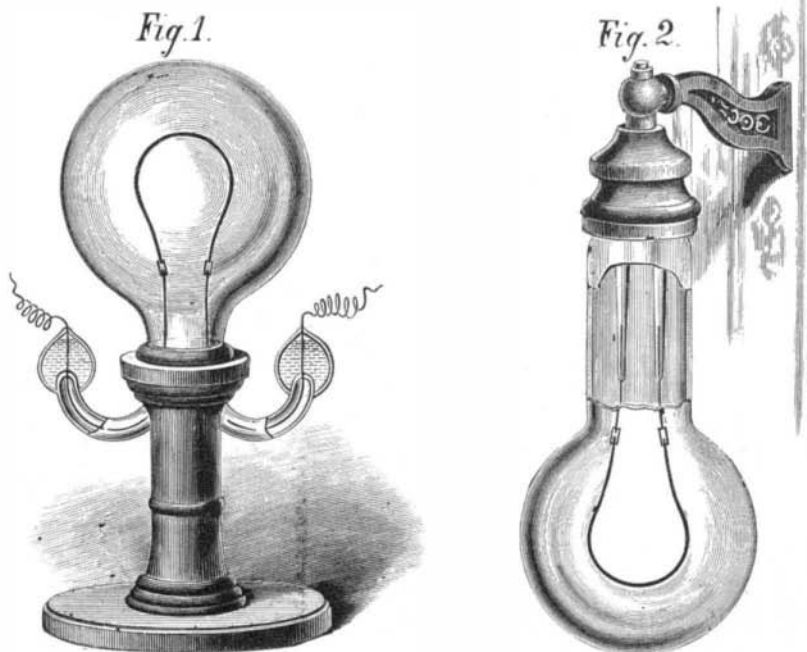
The lamp shown in the engraving will be recognized as an Edison lamp, the vacuum globe and the carbon horseshoe being the principal elements. Mr. John H. Guest, a well known electrical inventor of Brooklyn, N. Y., judging from his own experience in fusing platinum with glass in the manufacture of thermostatic fire alarms, concluded that the principal trouble with the Edison lamp would be the entrance of air around the wires passing through the glass of the vacuum globe, devised a simple plan of sealing the joint between the wires and the glass by means of mercury, thus interposing an effectual barrier to the entrance of air at that point.

The invention is so clearly shown in the engraving that scarcely a word of explanation is necessary. In the lamp shown in Fig. 1, the wires that convey the current to the carbon horseshoe are sealed in the ends of curved glass tubes communicating with the globe, and these joints are inclosed in small globes formed on the ends of the glass tubes and filled with mercury.

In this lamp Mr. Guest has made provision partially or wholly preventing the circulation of air, should any remain in the globe after exhaustion with the air pump. The device by which this is accomplished is simply a small globe connected with the lower portion of the lamp globe by a contracted passage, the theory being that the cooler and heavier portion of the air will be drawn into the auxiliary globe by its own gravity.

Fig. 2 shows a lamp in which the tubes that support the wires extend downward into the lamp globe. These tubes at their junction with the vacuum globe are fused to the platinum conducting wires, and the tubes act simply as lateral supports to the wires inside the globe, allowing the wires to expand freely lengthwise. The tubes are sealed outside the globe in the manner shown in Fig. 1.

Another improvement made by Mr. Guest consists in inclosing the ends of the platinum wire conductors in the ends of the material of the carbon before it is carbonized, the wire being formed into a loop to increase the conducting surface and to insure a good connection with the carbon,

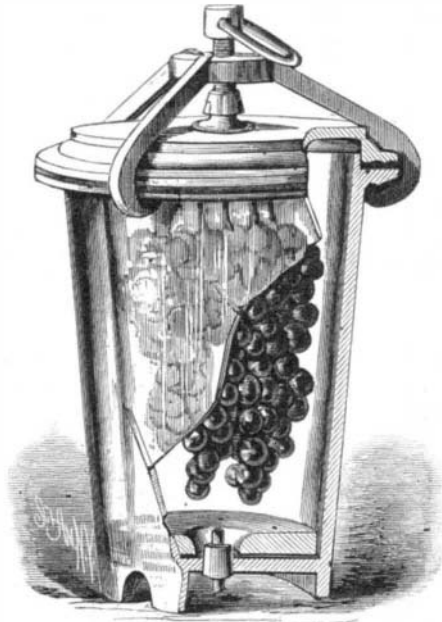


**GUEST'S IMPROVED ELECTRIC LAMP.**

oilcloth, and woods and metals. The bronze thus printed dries very rapidly, and cannot be taken off by oil or water, unless they are boiling. It bears light and heat equally well, and especially sulphureted hydrogen, which has such a destructive effect on bronzes put on in the form of powder. It is recommended to thin the mass by an addition of warm water, 10 to 20 per cent, so as to keep it from becoming too hard during the process of printing. An addition of glycerine or sirup, of 5 to 10 per cent, will be even preferable. The bronze color remaining on the printing forms can be taken off by warm water.

**APPARATUS FOR PRESERVING FRUIT.**

The annexed engraving represents a simple apparatus for preserving fruit in its natural state, by means of a partial vacuum. The vessel is especially designed for the purpose, and is provided with an absorbent which takes up whatever moisture may emanate from the fruit. The vessel is pre-



**FRUIT-PRESERVING APPARATUS.**

ferably made of glass or earthenware, and is provided with a cover having a packing ring and a device for receiving the stems of the fruit. The cover is secured to the vessel by an adjustable screw clamp. In the bottom of the vessel there is an absorbing ring made of burnt or dried clay, which absorbs the moisture escaping from the fruit. The air in the vessel is rarefied either by heat or by the application of an air pump to the opening in the bottom.

This apparatus was recently patented by Mr. Carl J. Renz, of Hudson, N. Y.

**New Process for Printing Gold and Silver Colors on Carpetings and other Textiles.**

(Translated for the Commercial Bulletin.)

Gold and silver designs for carpeting and oilcloths have been hitherto prepared in the following manner: The gold or silver were put in leaves or bronze powder on the designs, which were printed with a varnish of linseed oil, or similar adhesive. The bronze thus attached did not possess much firmness, and the method was necessarily expensive. The method recently adopted by Wohlforth is as follows: The bronze powder is united at once to printing material. The liquid silicate of potash, or of oxide of sodium, answers this purpose. One part, by weight, of gold, silver, or bronze powder, along with two parts of the silicate, will give a print color, which is easily transferable by rollers to paper,

**The Edison Ore Separator Not New**

To the Editor of the Scientific American:

In your issue of June 19, 1880, I notice an illustration of an electro-magnetic ore separator invented by Mr. Edison, and patented June 1, 1880.

A device absolutely identical with this has been in use for the past ten or fifteen years at the emery works at Chester, Hampden county, Mass. I there saw it in use myself in November, 1876, and was informed, I think by Mr. Ames, that it was not patented, and that no valid patent could be granted upon it by reason of its long continued public use.

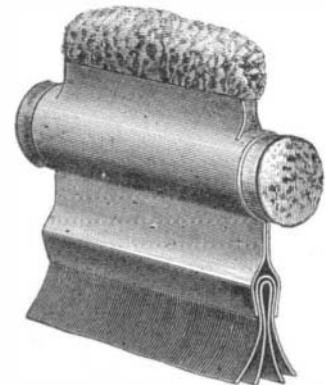
My uncle, John S. Williams, of this city, president of the Ore Knob Copper Company, had heard of the machine, and sent me to Chester with a view to purchasing the right to use it at the Ore Knob Copper Works, in Ashe county, North Carolina. On my return to Baltimore I had the magnets constructed by Watts & Co., electricians, on November 24, 1876, for a large machine, similar to the one at Chester, which machine was completed about December 10, 1876, and practically tested at No. 52 Commerce St., Baltimore. It was sent to the Ore Knob Mine about Christmas, 1876, to be used in separating magnetic oxide of iron from the copper ore, and, for aught I know to the contrary, is in use there yet. This is a striking instance of how history repeats itself in inventions. Mr. Edison is doubtless an original inventor of the device, but he most certainly is not the first inventor.

R. D. WILLIAMS.

Baltimore, Md., June, 1880.

**NOVEL SLATE WASHER.**

Few articles meet with a readier sale or more promptly remunerate the inventor than the class of inventions adapted to the use of children either in their school life or in their amusements. One of these useful little novelties is shown in our engraving. It is a slate washer, consisting of two



**SMITH'S SLATE WASHER.**

pieces of metal stamped up so as to form a holder for the sponge at the top and the cloth drier at the bottom. They also form a tubular receptacle containing a supply sponge, which is moistened by removing the corks at the ends.

This invention was recently patented by Mr. Jacob A. Smith, of Salem, Ohio.

**The Utilization of Genesee Falls.**

The plan to furnish Rochester, N. Y., with power for manufacturing and for running street cars through the utilization of the falls of the Genesee in compressing air, was described in this paper some weeks ago. All the power of the lower falls, save what is needed to run two wheels for factories already in operation, has been purchased by the inventor of the system, and a promising beginning has been made. According to the Rochester Union, a large gang of men are at work building the crib just below the falls on the east side of the river in a cove which seems to have been made by nature for this purpose. This foundation is 100 feet long by 75 feet wide, and will have an average depth of 13 feet. It is being constructed of solid logs of oak timber bolted together, and the center will be filled with stone. On the top of the crib will be erected the derrick, 125 feet high, and the water will pour into it from the top of the falls through the bulkheads at one end of the dam. The stand pipes will run from the top of the derrick to the cylinders on the crib, which will be in the neighborhood of 500 feet long. The whole machinery will be roofed in. The difficulty in the way of getting the materials to the place, they all having to be lowered over the falls, makes the work of construction somewhat slow. It is expected,

however, that the first application of the system to the propulsion of street cars will be possible in September next.

**Stevens Institute of Technology.**

The commencement exercises took place on June 16 and 17, and were of a very interesting nature. On the 16th President Henry Morton delivered an able address before the graduating class on "Popular Fallacies in Engineering." We intend to publish the address in full in our next week's SUPPLEMENT.