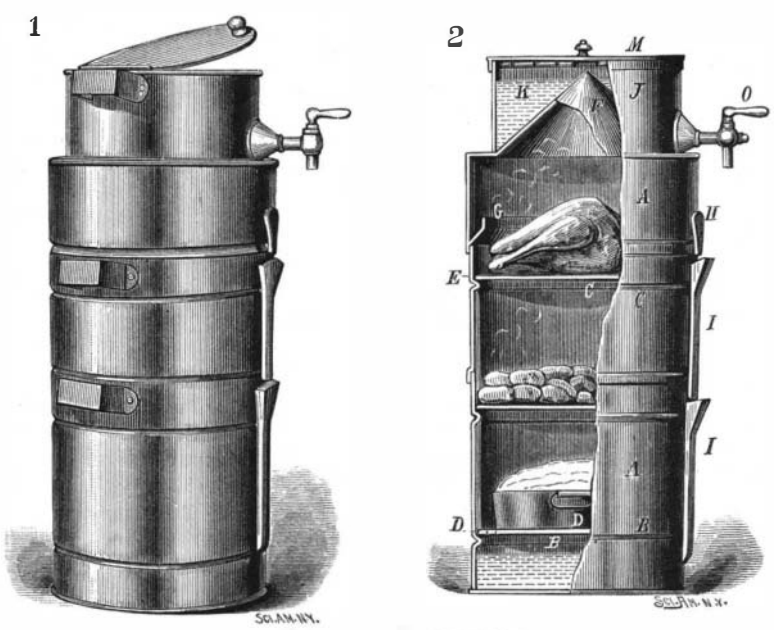
COOKING STEAMER.

The accompanying engravings represent a cooking steamer constructed with vessels having inwardly projecting beads near the upper and lower ends, to form flanges to support the partitions, upon which are placed the substances to be cooked. The lower partition, D, has a number of perforations formed through it to allow the steam generated in the lower part of the vessel to pass freely into the space above the partition. The next partition is made without perforations, so that steam can only enter the next space by raising the partition and passing up around its edges, the partition thus serving as a valve and causing the cooking to be done with steam under a slight compression. The lower edge of the cover fits snugly around the upper edge of the top vessel, and has a conical section as shown in Fig. 2. A flange, G, is secured to the inner surface of the cover at a little distance from the lower edge of the sides, forming a trough to receive the condensed water, and also serving as a shoulder to rest upon the upper edge of the vessel, and support the cover.

In a hole in the side of the cover at a little distance from its lower edge, is a siphon, H, the short arm of which extends nearly to the bottom of the trough, and its long arm extends downward at the outside of the cover, so as to discharge the outflowing water of condensation into the funnel-shaped upper end of the pipe, I. The lower end of the pipe enters the upper end of a similar pipe whose lower end is connected with an aperture in the side of the vessel, A, below the lowest bead, so that the water can flow back into the steam generating chamber. To the conical top of the cover is secured the lower edge of an annular flange, the space within which is divided into two compartments by a vertical partition, to the upper edge of which are hinged the straight edges of two semicircular lids. Each compartment is provided with a wire gauze screen, and within which is a faucet, so that the compartments may be used for making tea and coffee when desired.



COOKING STEAMER.

In the several parts of the steamer are secured plates of glass in order that the operator may see whether the chambers are filled with live or partially condensed steam, so that he can regulate the application of heat. To use the steamer, water to a depth of one or two inches is poured in the lower vessel, when it is placed over an oil stove or other heat producer. While in operation all the steam is confined within the vessel, as are all odors arising from the cooking substances. As none of the condensed steam falls upon the food, it is kept dry, and does not become soggy.

This steamer is now being manufactured by the National Cooking Steamer Company, of Lancaster, N. H., who will furnish further particulars.

A New Electric Railway.

A light railway system, driven by electricity and running at high speeds, has been devised by Mr. F. Hahn Dauchell, C.E., of London, whose object is to effect the rapid transit of letters and parcels by electrical means. The distinguishing feature in its construction is that it has only one rail for the train to run on, instead of two, and that it is balanced by another rail overhead, which at the same time performs the function of conducting the electric current, and also prevents the train from leaving the metals, as it is embraced by side friction pulleys, placed in pairs and connected with the roofs of the carriages. A successful working model has been tried; in it the wad is circular and about 8 feet in diameter, the motor being about 12 inches long, 8 inches high, and deriving its current from an ordinary bichromate battery. This motor, or engine, has a pair of grooved driving wheels of large diameter, and placed in line with each other. The object of this construction is to reduce the friction to a minimum, and thus facilitate the production of high speed. Mr. Dauchell proposes a speed of from 150 to 200 miles per hour, the railway being specially designed for the transit of letters, parcels, and light goods.

THE French Government, with a view to the revival of the somewhat languishing industry of coral fishing on the Algerian coast, has published a decree containing certain prohibitions and regulations on the subject. It forbids in future the use of machinery made of iron or other metal, as being destructive of the reefs, and preventing their reproduction.

The First Gas Burner.

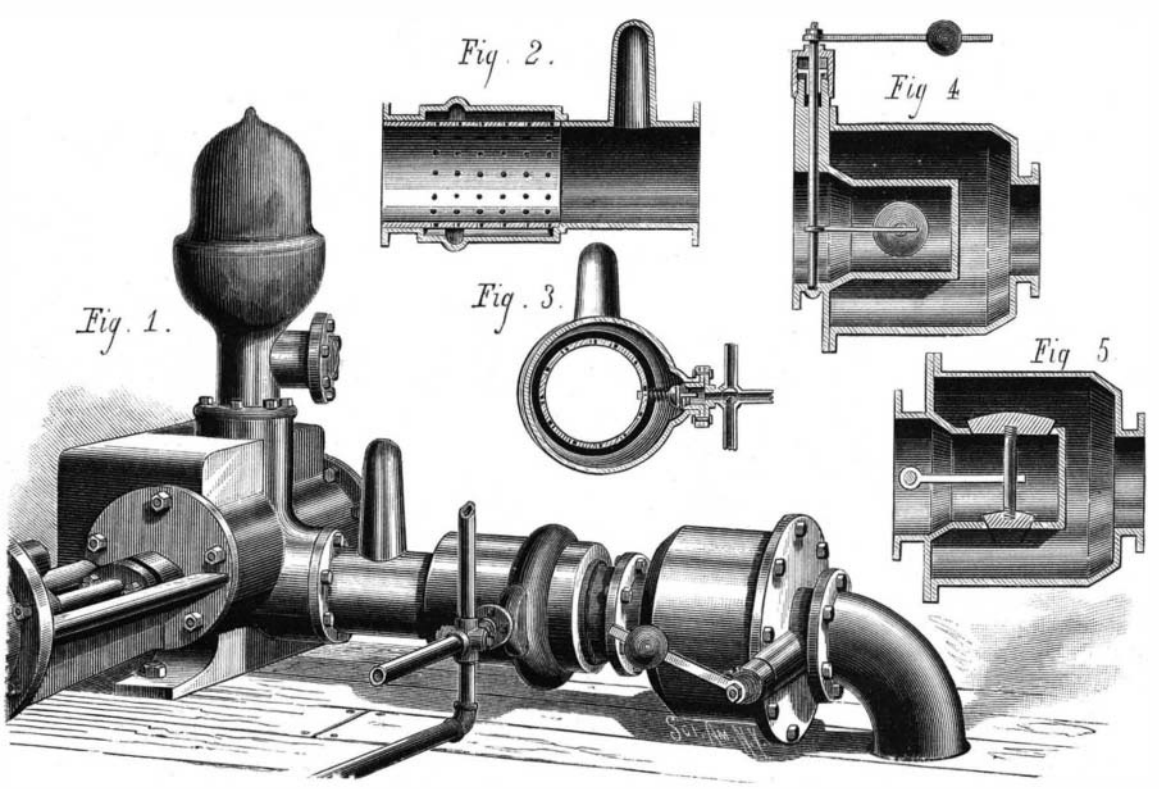
The first gas burner was a very simple and unpretentious contrivance. In one of the earliest works on gas lighting, we read: "The extremities of the pipes have small apertures, out of which the gas issues; and the streams of gas being lighted at those apertures, burn with a clear and steady flame as long as the supply of gas continues." Familiar as it is to us, and from its familiarity unnoticed, the phenomenon presented by the flame thus produced continuing to burn "as long as the supply of gas continued," was doubtless, to the first experimenters, a wonderful sight. Though we may smile at the question, it is not difficult to understand the incredulity of the honorable member who, when Murdock was examined before a Committee of the House of Commons, in 1809, asked the witness: "Do you mean to tell us that it will be possible to have a light *without a wick?*" "Yes; I do indeed," replied Murdock. "Ah, my friend," replied the member, "you are trying to prove too much."

REGULATOR AND CONDENSER FOR STEAM PUMPS.

The accompanying engraving represents a device for regulating the supply of water required to condense a certain quantity of steam, so that the quantity of water supplied will always be in proportion to the quantity of steam to be condensed; and also a device for condensing the exhaust steam from any steam pump or engine, so as to relieve the piston of back pressure. The regulator consists of a short pipe closed on top and provided with a flange for coupling it to a suction pipe. A short distance above this flange is a larger flange, on which a large vessel, surrounding the pipe, is bolted. The top of this vessel is provided with an adjustable balancing weight which seats the valves. The position of the weight can be adjusted so as to admit a greater or less quantity of water into the injection pipe, according to the amount of steam to be condensed. The apparatus can be placed in any position and can be attached to any injection pipe. It can be adjusted to maintain a high vacuum in the pump at all times.

In the suction condenser, shown in longitudinal section in Fig. 2 and cross section in Fig. 3, the suction pipe of a steam pump is provided with a series of perforations, and the perforated portion is surrounded by a pipe forming a jacket. The inclosing pipe is furnished with an eccentric channel (Fig. 2) for conducting the exhaust steam into the space between the two pipes; the depth of the channel gradually decreases from the entrance port for the steam to a point diametrically opposite, as indicated in Fig. 3. At the widest part of this channel is a neck containing a bushing, forming the seat for a puppet valve, mounted on a stem guided in an aperture in the suction pipe in a cross piece in the neck. The steam is conducted to the neck by the exhaust steam pipe, which is provided with a three-way cock, to permit adjusting the exhaust steam pipe for exhausting in the air. The condenser is provided with a vacuum chamber, to prevent pounding in the suction pipe. A spiral spring around the stem closes the valve automatically. When in operation, the steam is exhausted into the air until the water rises in the suction pipe to the perforated portion, when the steam issues in jets through the perforations into the water and is instantly condensed. The spring closes the valve after each exhaust of the pump, thus preventing the water from the suction pipe from rushing into the steam cylinder of the pump. The condenser is simple, and occupies but a small space. The steam from a steam engine can also be conducted to it, if desirable.

The large engraving shows the pump cylinder of a steam pump, to which is attached the condenser, from which leads the regulator to the suction pipe. These devices are now being manufactured by Messrs. Fink & Angevine, of Mount Riga, New York, who should be addressed for further information and catalogue.



REGULATOR AND CONDENSER FOR STEAM PUMPS.

a neck having a flange to which the condenser or suction pipe can be attached, so that the device will be interposed in the length of the suction pipe. Fig. 4 is a horizontal and Fig. 5 a vertical section through the regulator. The small pipe is provided with two opposite ports, one of which is larger than the other, in which fit valves connected by a rod having a slot in its middle, through which an arm passes, as shown in Fig. 5. The arm is attached to one end of a shaft which is journaled transversely in the bottom of the pipe, and passed through a tube provided with a stuffing box. The outer end of the shaft has an arm (Fig. 4) on which is

A Process for Softening Iron Castings.

A revolution in the manufactured iron trade is announced from Melbourne, where two local iron founders (Messrs. Jenkins and Law) are reported to have discovered a new process in their trade. It appears that an accidental discovery was the commencement of the invention; a fragment of cast iron having been dropped while hot into a water channel, and afterward broken, when it was observed to be soft and tenacious, instead of hard and brittle as might have been expected. This phenomenon led to inquiry and experiments, with a view to ascertain the reason for the change. It was supposed that the temperature of the metal and the composition of the water were the principal circumstances which combined to produce the transformation; and, after numerous trials, the right temperature to which the iron should be brought before immersion was discovered, and also what foreign elements were required in the water. The metal is merely dipped in the bath, not steeped, the required change being physical, not chemical; and the ingredients of the liquid are common and cheap. As patented, the process is briefly as follows: The castings are run in a chill, or iron mould, allowed to cool, reheated in a furnace to a particular temperature, and then plunged into the bath. Thus treated, the iron develops a close, tough, and comparatively soft grain, so much like that of average steel that, according to the *Melbourne Argus*, experienced founders in the colony had great difficulty in believing the metal to be cast iron at all. By this process it is claimed that the adamantine hardness of chilled castings is removed, and further positive advantages are conferred. This is saved by the great extension of chill castings for purposes to which their hardness formerly rendered them inapplicable. It is contended that the metal is also made much stronger; a bar that would break with a load of 1,200 pounds under the old system being capable, if made in the new way, of withstanding a strain of 1,900 pounds. Lastly, the soft, tough grain produced by the new process increases the facility of working the metal, with a corresponding diminution in the wear and tear of tools, and a finer appearance in the finished article.