

An Aid to Curing Alcoholism.

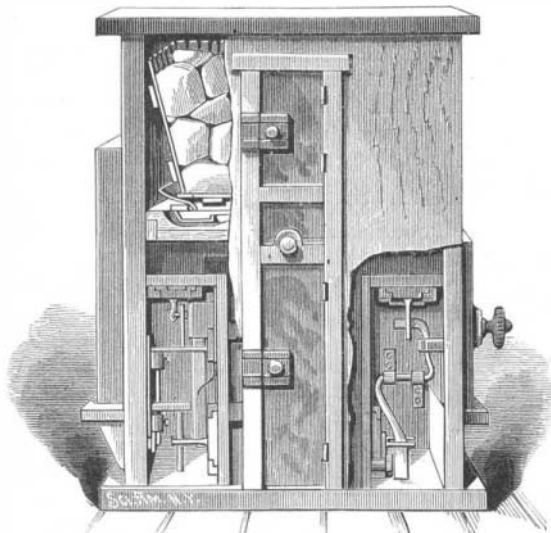
We believe the best authorities are generally skeptical as to there being any sure cure for confirmed habits of inebriety unless the effort in that direction be aided by a strong exercise of the will of the unfortunate subject of the bad habit. There are, however, many remedies recommended as aids in diverting or in a minor degree satisfying the appetite for strong liquors, which are undoubtedly of great advantage in some cases, and one of these is thus recommended by a self-styled "rescued man": "I was one of those unfortunates given to strong drink. When I left it off I felt a horrid want of something I must have or go distracted. I could neither eat, work, nor sleep. Explaining my affliction to a man of much education and experience, he advised me to make a decoction of ground quassia, a half ounce steeped in a pint of vinegar, and to put about a small teaspoonful of it in a little water, and to drink it down every time the liquor thirst came on me violent. I found it satisfied the cravings, and it suffused a feeling of stimulus and strength. I continued this cure, and persevered till the thirst was conquered. For two years I have not tasted liquor, and I have no desire for it. Lately, to try my strength, I have handled and smelt whisky, but I have no temptation to take it. I give this for the consideration of the unfortunate, several of whom I know have recovered by means which I no longer require."

IMPROVED REFRIGERATOR.

In the refrigerator illustrated in the annexed engraving, the air passages leading from the main chamber to the side air chambers are opened and closed from the outside, thereby excluding the warm outer air from the main and also from the ice chamber when the doors of either of the side air chambers are opened. It is formed with a central and two side air chambers, each of which has a door or window communicating with the outside.

The chambers at the sides of the central chambers are each formed with a side and top wall provided with openings that are closed by slides, in order to prevent the outer air from reaching the chamber and the ice chambers when the doors are opened. These slides may be operated in the same manner as those described, or they may be connected to a door or window by rock shafts so that opening the latter will close them at its first movement, while closing the latter will open them at its last movement.

Above these is the ice chamber, in the bottom of which are air passages that may be closed to cut off all communication between the ice and provision chambers before open-

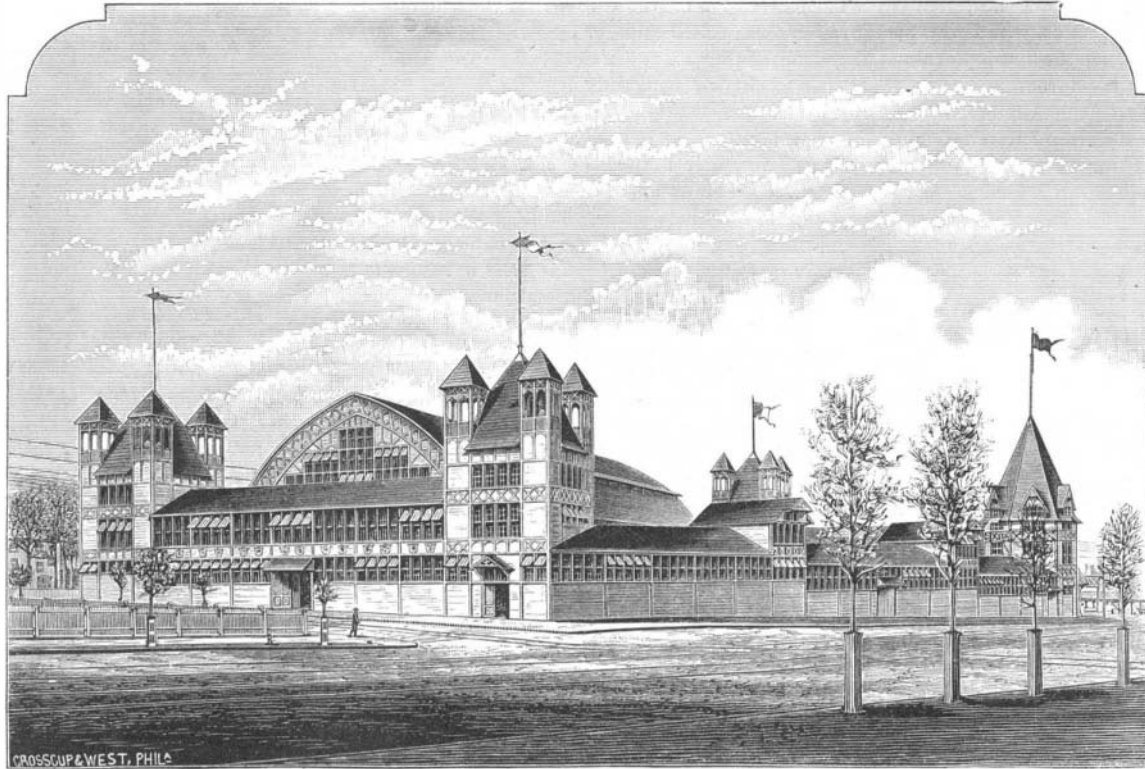
**BERENS' IMPROVED REFRIGERATOR.**

ing the door of the main chamber, the object being to shield the ice from the current of warm air which would otherwise rush in to fill the vacancy caused by the cold air rushing out. These air passages are opened and closed by slides connected together by pivoted arms operated by a rod projecting through the refrigerator wall; the rod is graduated in order that the amount of cold air can be regulated. In this refrigerator, the cold air not escaping while it is open, it requires but little ice and keeps the temperature even.

The engraving shows two other chambers in which provisions may be put temporarily. The wall separating these chambers from the main chamber can be readily removed for cleaning. This invention has been patented by Mr. Charles J. Berens, of Washington, Indiana.

THE INTERNATIONAL ELECTRICAL EXHIBITION.

As has already been announced in the columns of our paper, an International Exhibition will be held at Philadelphia next autumn, under the auspices of the Franklin Institute, of the State of Pennsylvania, for the Promotion of the Mechanic Arts. The exhibition will be formally opened on Tuesday, Sept. 2, 1884, and will remain open until Saturday, Oct. 11, 1884.

**BUILDING FOR THE INTERNATIONAL ELECTRICAL EXHIBITION AT PHILADELPHIA.**

The accompanying plate is a view of the exhibition building, which is now in process of erection, and which, by the terms of the contract, will be finished by the 15th of June. The building is being erected by Mr. Jacob R. Garber, from the plans of the architects, Messrs. Wilson Brothers & Co.

The following brief description will give a general idea of its character:

The main-building will be rectangular, having a length on Foster Street of 283 feet and a breadth of 160 feet, extending from Foster Street to Lancaster Avenue on Thirty-second Street, and part of the distance from Foster Street to Lancaster Avenue on Thirty-third Street. A tower sixty feet high will be situated at each of the four corners of this building. One central arch of 100 feet span and 200 feet in length, of the Gothic style of architecture, will cover the greater portion of the space occupied by this building, while two smaller ones, having a span of thirty feet and running parallel to it on either side, will join the towers. The building will have second story apartments at its ends on Thirty-second and Thirty-third Streets respectively, with stairways leading up in the towers from the ground floor. The towers themselves will be three stories high. Two long and narrow hallways will afford communication between these apartments. The remainder of the ground will be inclosed by a large triangular building, one story in height and joined in the main wall. The main entrance will be at the corner of Thirty-second Street and Lancaster Avenue, another at Thirty-third and the Avenue, and one at each of the other towers. Five exits are provided for on the plans, but desirable changes may hereafter be made in the number and situation of both entrances and exits before the work is completed.

The meeting of the American Association for the Advancement of Science, which will be held this year in Philadelphia, and the expected presence of many representatives of the British Association, which will meet this year in Montreal, will attract a numerous and influential scientific gathering in Philadelphia during the time of the holding of the exhibition; and in order that so exceptional an opportunity to promote the interests of science shall not be lost, Congress has been requested to authorize the holding of a National Conference of electricians, to convene in Philadelphia at this time. Should Congress, in its wisdom, make the proper provisions for holding such a conference, the results promise to be of much value.

A comprehensive scheme of classification has been carefully elaborated; a system of rules and regulations to govern the internal management of the exhibition has been adopted; provisions have been made in the interest of intending foreign exhibitors, to relieve them of all trouble in respect to the passage of their exhibits through the Custom House, and the proper reception and care-taking of the same on their arrival; and arrangements have been made with a number of the leading transportation companies to return, free of charge, goods on which freight charges have been paid one way.

The above information, expressed in detail, has been published in the form of a twelve page pamphlet, which, with a blank form of application for space, has been issued in the English, French, and German languages, and exten-

sively circulated in the United States and throughout Europe.

There are evidences at this time, even, that the exhibition will be one of unusual interest and value. The active participation of several of the scientific bureaus of the United States Government and of all the leading electrical companies is assured. Numerous inquiries both from official and private sources have been received from abroad, and interesting and valuable contributions from European countries are confidently anticipated.

The circular of information herein referred to, with blank forms of application for space, may be obtained in the English, French, or German language by addressing a request therefor to the Secretary of the Franklin Institute, Philadelphia, Pa.

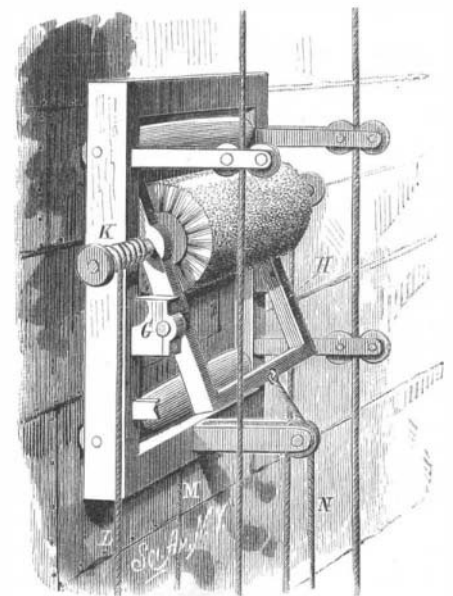
We are indebted to the courtesy of the *Journal of the Franklin Institute* for the cut which accompanies this article.

A Plan for Controlling the Spring Floods.

A Canada correspondent suggests that, instead of one great reservoir, that would be dangerous as well as expensive, it would be better to build a system of detaining works on all the small streams. The idea is to begin at all points where a four inch pipe will discharge the average water, and there make a two-foot bank to hold back the surplus, building "hundreds of thousands" of these small dams, at a cost of from five to ten dollars each.

IMPROVED SHIP CLEANER.

In the frame, which is made strong and light, are journaled two parallel curved rollers, which keep the frame about an inch from the bottom or side of the ship. From near the corners of the frame project four arms, and in the end of each are placed two wheels, between which the tightly drawn guide ropes pass. The frame is easily raised and lowered on these ropes, and brought against the surface to be cleaned. A frame, H, is pivoted in the blocks, G, projecting from the sides of the main frame. In the upper part of this frame is journaled a brush made with bristles of steel wire about six inches long. The shaft, K, of the brush projects beyond the sides of the frame, and is worked by means of two ropes, L, coiled reversely upon the projecting parts. When the brush is revolved in one direction by pulling on one rope, the other rope will be wound on the shaft and so on alternately, the shaft being revolved in opposite directions. The lifting rope, N, is secured to the end of the

**COOPER'S IMPROVED SHIP CLEANER.**

frame, H, passes over a pulley in an arm on the lower bar of the main frame, and then extends to the deck or to a boat at the side of the vessel. By pulling on this rope the lower end of the frame, H, will be lifted from the side or bottom of the ship, and the brush will be pressed against it. The degree of pressure can be regulated at will, and barnacles, rust, paint, etc., can be removed from a ship in a short time. The machine is rigged for work by extending a rope between suitable supports, and from a pulley on this rope are hung the guide ropes, which extend under the ship and over the gunwale on the other side.

This invention has been patented by Mr. J. L. Cooper, and further particulars may be had by addressing Mr. James O. Cooper, No. 165 Fourth Street, Portland, Oregon.

An Etching Ink for Glass.

For writing on glass with an ordinary steel pen, Dr. M. Muller prepares an ink containing fluorine. Equal parts of hydrofluoric acid, fluoride of ammonia, and dry precipitated barium sulphate are rubbed together in a porcelain mortar. When intimately mixed the mass is transferred to a dish made of platinum, lead, or gutta percha, and fuming hydrofluoric acid poured over it successively and rapidly stirred with a gutta percha rod, shaped like a pestle, until the impression left by the rod quickly vanishes. Glass written on with this ink is etched immediately, and the etched portions are so beautifully roughened that they are visible at a long distance. The ink only needs to act for fifteen minutes on the glass, and a longer action may be harmful, as the edges lose their sharpness.

In making good etching ink, the quality of the barium sulphate is of great consequence. It must be prepared by precipitating the solution of a barium salt (the chloride) with an excess of sulphuric acid, washing well by decantation, filtering, and drying at 248° Fabr. (120° C.). It is only in this manner that it can be obtained sufficiently fine and impalpable.

This ink cannot, of course, be kept in glass bottles, but only in gutta percha vessels closed with corks protected with wax or paraffine. Owing to its greater specific gravity, the barium compound used to thicken it naturally settles, hence it must be well shaken each time before using. It can be preserved in glass bottles that are protected within with a layer of wax or paraffine, which can be easily applied by warming the bottle over an alcohol or other smokeless flame, dropping in a piece of wax, and continually turning the bottle to bring the melted wax in contact with all sides. Even fuming hydrofluoric acid can be kept in such a bottle.

Concentrated hydrofluoric acid may cause serious inflammation and even ulcers, if left in contact with the skin for some time, so that care should be taken both in making and using the ink not to touch it to the fingers.

To make the etchings more distinct, and visible at a greater distance, it is frequently necessary with delicate lines, especially on graduated chemical ware, burettes, eudiometers, etc., to rub some red lead, soot, or clay over them. A small quantity adheres to the roughened surface, but it soon rubs off. The etchings made with this ink are so much rougher that if a strip of metal is rubbed over the lines some will adhere, and they acquire the color and luster of the metal. If a name is written on glass with this ink, and then the spot is rubbed with a thick brass wire, the name will appear in golden letters, and may be protected by a thin, colorless varnish. Lead may also be used, but for chemical apparatus, Dr. Muller employs platinum. — *Neue Erfind. und Erfahrungen.*

THE REMINGTON DROP HAMMER.

The Remington drop hammer, the cut of which appears on this page, is of that class in which the hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we only describe the improvements.

These consist in the lifting arrangements being detached from the upright ways, and in such a manner that the lifter gets no jar from the hammer, as it does in other drops. The lifter is made of a peculiar style adapted to this class of machines, very strong in all its parts. The friction rolls running parallel with each other are keyed strongly on a three inch shaft, and run in fixed bearings. One of the shafts is turned on an eccentric, and on the end of this there is a shackle or adjustable lever, which is connected with a rod which runs down by the ways, and is connected with the base. On this rod are two clamps, which are easily adjustable, to vary the height of the hammer, in order to give a light or heavy blow. An automatic trip is connected with the catch bar in such a manner as to enable the operator to readily give any number of blows he may require, and at the same time have free use of his hands. The lifter can be used with any other drop. For further information address E. Remington & Sons, Ilion, N. Y.

DURING the gales of the 26th and 27th of Jan., unprecedented wind pressures were experienced at the Forth Bridge works. Mr. Benjamin Baker reports that the strongest gusts gave a momentary pressure of 35½ pounds per sq. ft. on a large board, 300 sq. ft. area, and no less than 65 pounds per sq. ft. on a small board, containing 1.5 sq ft.

IMPROVED STEAM ENGINE.

The annexed engraving shows a compact and light steam engine and boiler of simple construction, manufactured by Mr. A. H. Shipman, of Rochester, N. Y. The boiler is made from cast iron sections, having wrought iron tubes screwed

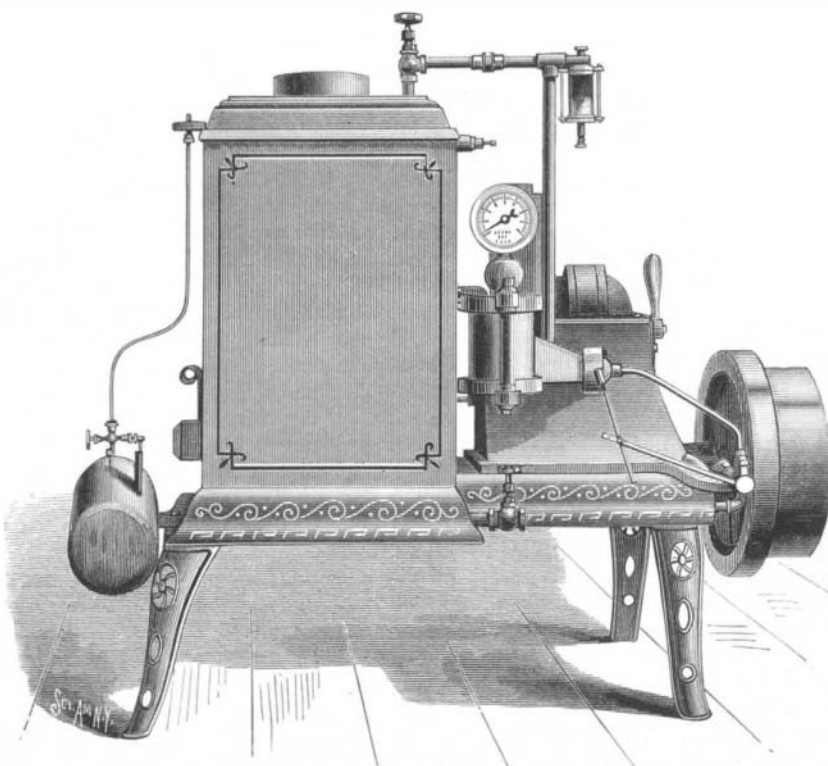
in the boiler increases, the diaphragm closes, and the amount of steam admitted to the atomizer diminishes accordingly, thereby regulating the quantity of oil burned.

A lowering of the pressure produces a contrary effect, and the fire is increased. The tank of oil can be kept at any distance from the engine and brought to it by a pipe. An automatically regulated pump, with plunger connected direct to main shaft by an eccentric, keeps the boiler constantly supplied with the proper quantity of water. The engine is placed in close proximity to the boiler, so that loss resulting from the use of long connections is avoided.

The cylinder and its parts are inclosed in a steam tight box in which the steam exhausts. This keeps the cylinder hot, and insures the complete oiling of all the parts.

The engine has two cylinders, with steam chest between them, and two piston heads, one to each cylinder, connected with a small rod. The pistons are hollow, and as the movement is vertical there is no friction caused by their weight. The lower piston head is connected with the pitman, which is attached direct to the main shaft, no crosshead or slides being used. The valve is balanced. A governor acting direct upon the valve is applied to engines for stationary work.

The engine is especially designed for propelling small boats because of its small size, light weight, little attention required and the small amount of room needed for storing fuel; when it is to be used for this purpose it is made reversible. The engine shown in the cut is furnished with a balance and band wheel for stationary work.



SHIPMAN'S IMPROVED STEAM ENGINE.

into them, and bolted together. Radiation is prevented by double jackets of sheet iron having an air space between them. An intense blast of fire is formed by pressure of air or steam flowing through an atomizer which throws a fine spray of kerosene into a fire box in the boiler, the fire being

If a solid mill intended for dressing a width of six and sometimes eight inches is broken at any portion of its length, its usefulness will be impaired by so much as the break removes from the teeth their cutting surface. No remedy exists but annealing, turning down, recutting, and rehardening. Consequently, built up mills, are used for wide stretches, disks of three-quarters of an inch thickness, or less, being placed side by side on the same arbor and held by a set-up nut. If one of these breaks a tooth, it is a matter of slight consequence compared with the loss when a long mill breaks; the broken disk may be removed and a whole one substituted.

But these built up mills leave necessarily behind them narrow uncut ridges, showing where the disks met side by side, and thus making imperfect work. An ingenious device has remedied this defect and made the built up milling tool as perfect in the results of its work as the solid and expensive mill. The sides of the mill disks are cut into radial projections to the depth of the teeth, an alternate projection to an alternate depression—understood by recalling the old-fashioned shaft couplings cast with lugs on their engaging sides, so that they locked together. By this method of forming the mills any number may be placed on a spindle, or arbor, and interlocked, making a solid mill that will leave no circumferential tracks on its work.

This mill has another advantage. Inside the circumference of alternate projecting teeth is a turned and finished portion extending from the center hole out to the root of the teeth, forming the solid bearing of one disk against those next to it when they are assembled and set together with the common binding nut.

If two disks side by side make a cut exactly one and a half inches wide, which it is desirable to widen to one inch and nine-sixteenths, this may be done by introducing "skims" or washers of paper without impairing the face continuity of the built up mill.

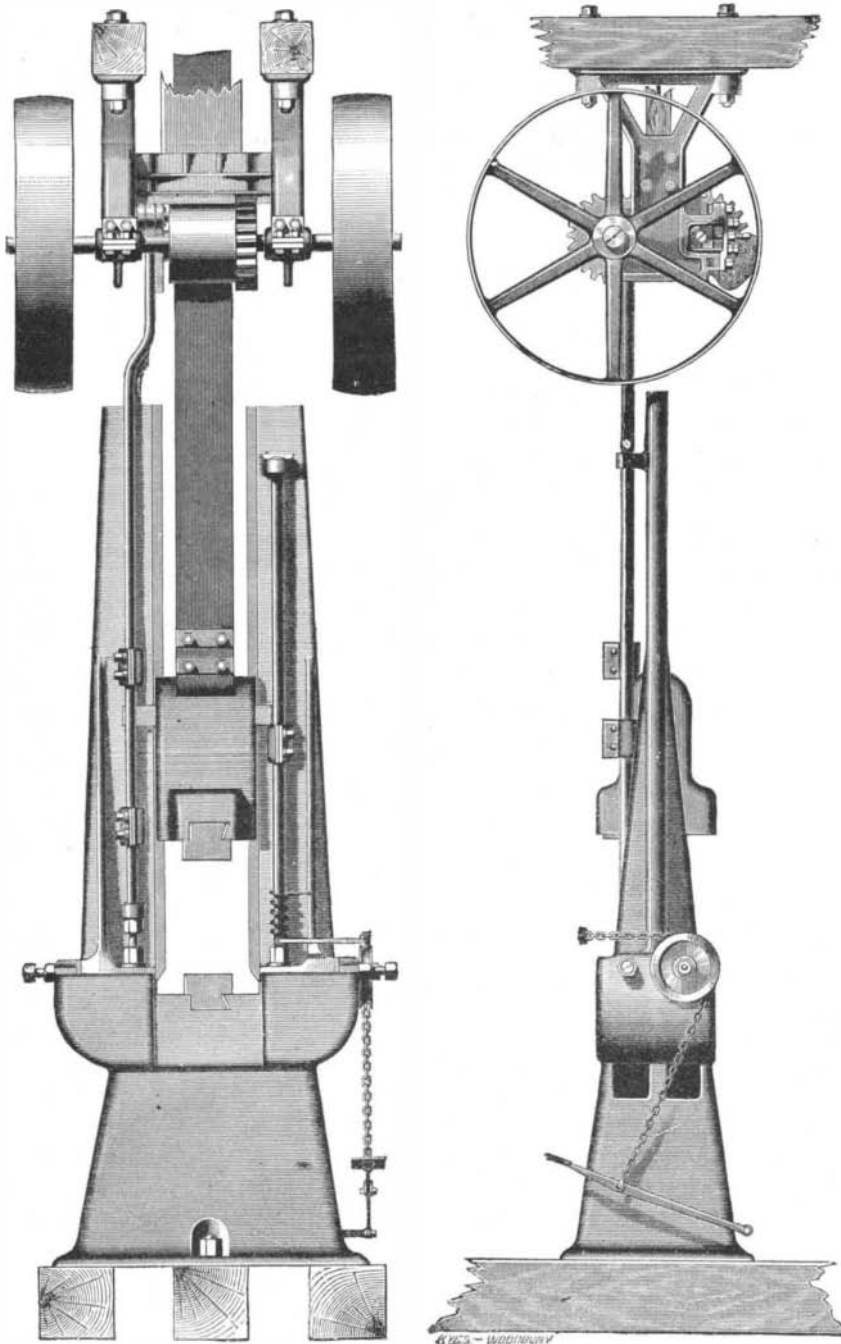
How to Increase the Temperature of Furnaces.

There is one application of gas as a fuel which was discovered by Mr. Fletcher two years ago, but is not generally known. This is the addition of a very small quantity of coal gas or light petroleum vapors to the air supplied by a blower or chimney draught to furnaces burning coke or charcoal.

The instant and great rise in temperature in the furnace, and the great stability of the solid fuel used, are extraordinary.

This is in fact, a practical application of the well known flameless combustion, the only sign that the gas is being burnt being the great rise in temperature and a decreased consumption of solid fuel; indeed, solid fuel is not necessary.

To polish tarnished nickel, use chalk or rouge mixed with tallow.



REMINGTON DROP HAMMER WITH DETACHED LIFTER.

so placed as to be completely surrounded by water. This plan insures the combustion of all the oil, does away with smoke stack, and utilizes the heating power of the fuel. A diaphragm controls the fire, so that an even pressure of any desired amount can be carried at all times. As the pressure