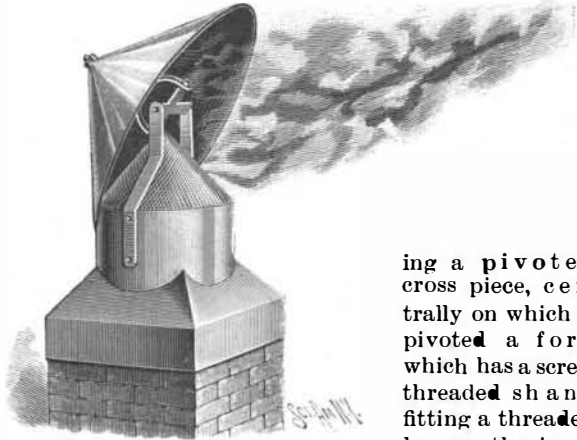


A CHIMNEY COWL OR VENTILATOR.

An inexpensive and simple device, for attachment to chimneys, air shafts, etc., is shown in the illustration, and has been patented by Mr. Milo H. Ingalls, of North Granville, N. Y. The cap is adjustable, so that it may be held at any desired distance from the flue top, and it is immediately responsive to the direction of even a light wind, thereby preventing any draught and increasing the updraught, while keeping out rain, snow, etc. On opposite sides of the flue are inwardly and upwardly extending side arms support-

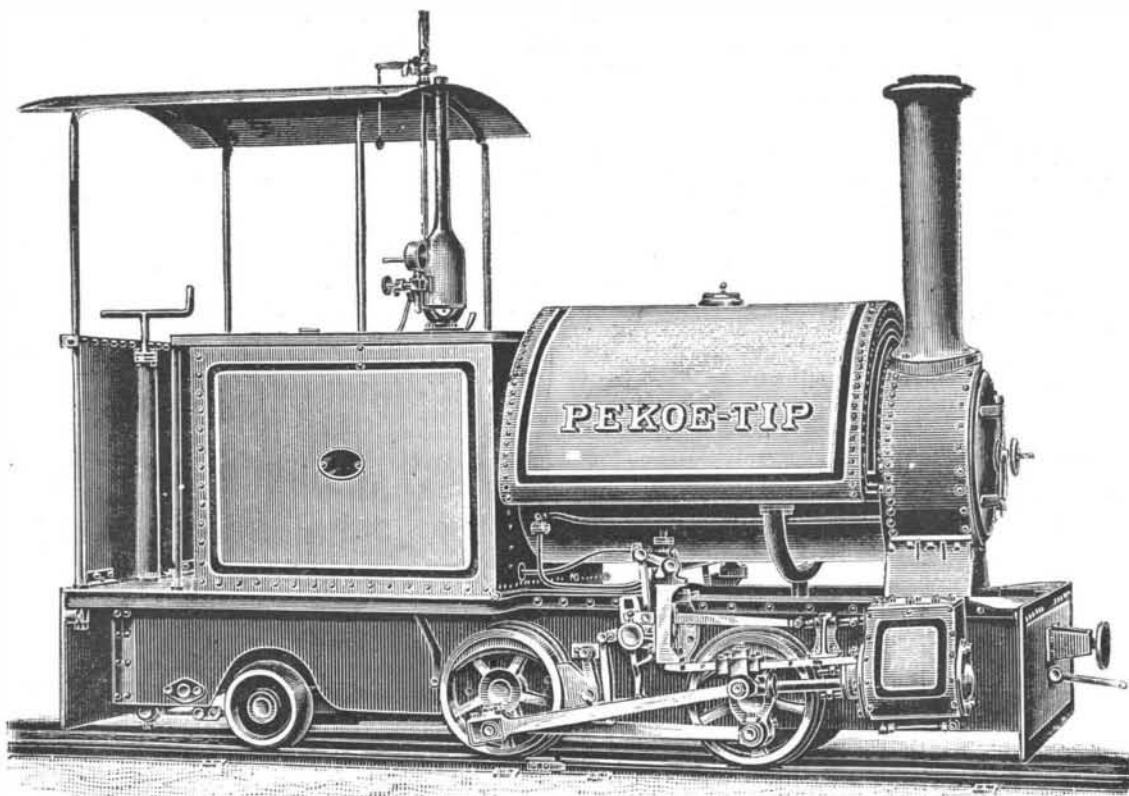


INGALLS' CHIMNEY COWL OR VENTILATOR.

ing a pivoted cross piece, centrally on which is pivoted a fork which has a screw threaded shank fitting a threaded lug on the inner side and at the apex of the conical cap. Above the cap is a nut, holding the cap in place, while its supports form a universal joint permitting it to turn in any direction. The upper end of the flue is preferably provided with a conical spark arrester made of wire screening, and fastened to the flue by means of a bushing. Great advantages are claimed for this improvement as a ventilator for buildings, air shafts, passenger cars, etc., as well as in its employment as a chimney cowl.

A TWO FOOT GAUGE LOCOMOTIVE.

We illustrate from the Engineer, London, below, a little locomotive constructed by Messrs. W. G. Bagnall, Limited, Stafford. The dimensions are as follows: Cylinders—diameter, 5½ inches; stroke, 9 inches; wheels, four-coupled—diameter, 2 feet; centers, 3 feet; wheels, bogie, diameter, 1 foot; total wheel base, 6 feet; boiler, Siemens steel; firebox, Siemens steel, circular; tubes, steel, 1½ inches diameter; heating surface—tubes, 80 square feet; firebox, 10 square feet; total, 90 square feet; grate area, 3.28 square feet; fuel capacity, 7 cubic feet; water capacity, 140 gal-



NARROW GAUGE LOCOMOTIVE.

lons. The engine is made for a 2 foot gauge, and is fitted with Baguley's patent valve gear.

Facts About Fatigue.

Dr. Tissie, a well-known French physician, has been studying the subject of excessive physical culture. He points out, in Science Siftings, that there is a similarity between the nervous fatigue which follows violent and prolonged exercise and certain hypnotic states. All fatigue is in the nerves; the muscles simply lose their power. In violent and prolonged physical exercise the waste of the body is rapid and extreme, and at the end its victim is in a state of poisoning from the accumulation of waste products in his system not yet thrown off. He is like a patient recovering from some disease. The muscular overstrain in the case is like

that which results from such nervous shocks as are sometimes produced by violent emotions or by dreadful dreams. Dr. Tissie made a special study of the case of a runner in a "go-as-you-please" race which continued twenty-four hours. The first effect of the nervous exhaustion was a feeling of great fatigue, followed by loss of interest and disgust. Next came phenomena of illusion or hallucination, of double personality, loss of memory, and great need of sleep. The doctor claims that the real aim of every trainer for the ring is to produce an automatic state in the one who is to take part in the contest of physical strength. His whole science is to transform the man he trains into a being that will keep on automatically. Something of this occurs in all overstrain from prolonged physical exercise. The plodding action which results is akin to the constant repetition of the same word, over and over, until it becomes a fixed idea in the mind. The doctor's conclusions are that the abuse of athletic sports is an evil; that the players lose character and tend to retrograde from intellectual volition to a habitual automatism. Just as moderate exercise is good, so these intensive exercises are bad.

The Tea Industry in Japan.

The United States consul at Nagasaki says that in that Ken tea cultivation is conducted as follows:

On inclined ground the tea is planted in furrows, but on level ground the plants are grown separately. The space between each row is about three and a half feet. On the hillsides it is planted in rows, but on the plains and near the houses it is grown in circular patches. After the first and second leaves are picked the branches are cut with shears. The object in cutting is mostly to make the plant round or semicircular. Formerly the plant was cut down to the ground every three years. The ground is cultivated three or four times in the spring, summer, and autumn. The grasses are cut and manure applied twice a year—in spring and in autumn. For manure, night soil, green weeds, accumulated soil, oil cakes, and fish are used. These manures are used only for plants near people's residences; for those on the hillsides, weeding is performed twice a year, in spring and in autumn, and the weeds are used as manure.

The season for gathering first tea buds or leaves begins on the first or second of May; but in some localities first leaves are gathered about the 20th of May. Second buds or leaves are generally allowed to grow, unless the market price is very high, or the first leaves gathered are found much smaller than usual. In the vicinity of Omura and Hirado, however, they gather both first and second leaves. In picking leaves for the

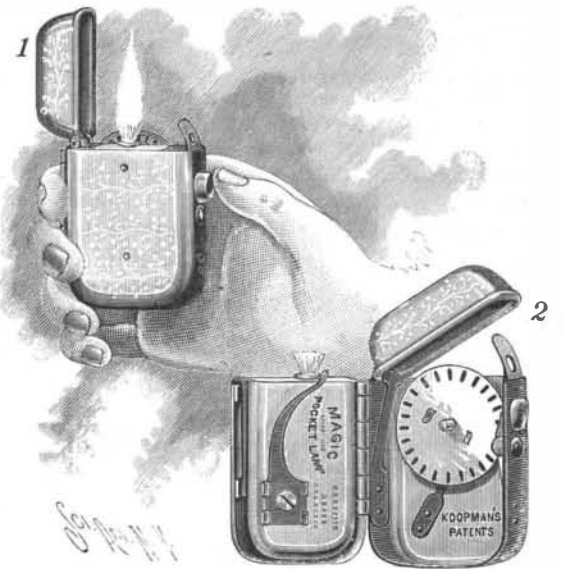
best tea, three tender leaves are picked together; for the middle and lower classes of tea, five leaves are picked at once; and for the lowest, all the young leaves are gathered. In picking leaves women are usually employed. The average quantity of the three leaves picked by a woman is from ten to thirteen catties a day (a catty is equivalent to 1.31 pounds avoirdupois). The manufacture was formerly conducted in two ways, namely, by drying in the iron pan, or in the sun, then drying in paper utensils was introduced, and more recently, drying in bamboo baskets came into vogue. The method of drying in the iron pan is still extensively used.

For manufacturing black tea, the Indian method was formerly followed, but at present the Chinese method is adopted. For sorting tea leaves heated in paper

utensils, round and square sieves are used, and for rolling utensils, either case or bag is used. Night soil, oil cake, dried fish, green grass, and weeds are considered the best manure for tea plants. The hours of labor are from 5 in the morning until 6 in the evening. The daily product per man is as follows: With the iron pan, about thirty catties; with the paper utensil, about twenty catties; with the bamboo basket, about forty-five catties. The women are employed only at steaming the tea leaves, and are paid only half the rate of the payment to the men. When the season arrives, the workmen are hired daily, the farmers helping each other. In Omura, contracts are made beforehand by advancing money about January or February.

A POCKET LAMP AND CIGAR LIGHTER.

The convenience of having in one's pocket a small self-lighting lamp which is always ready for use, and which takes up no more room than an ordinary match box, is afforded by the "Magic" pocket lamp and cigar lighter, shown in the illustration, and which has been put on the market by the Magic Introduction Company, of No. 371 Broadway, New York City. The



A POCKET LAMP AND CIGAR LIGHTER.

case is an ornamental one, silver or nickel plated, and by pressing with the thumb upon a spring button, the cover flies open and a wick protruding from a little oil reservoir is lighted. When the spring is only partially pressed in, the cover opens without lighting the wick, but the stronger pressure upon the spring causes also the simultaneous revolution of a lighting disk, whose edges are marked with small deposits of match composition, the passage of one of which under a spring finger lights the wick. The relative positions of the lighting disk, the igniting finger, and the wick may be seen with the case open, as shown in Fig. 2. With a complete outfit a small bottle of oil is furnished, with a filler and a number of extra lighting disks, all in a small package, but any good oil can be used instead of that furnished by the company, very little oil being ordinarily required, only just sufficient for the saturation of the wick, thus avoiding any possibility of soiling the clothing. The lighting disk is reversible for use on both sides, and is readily replaced by a new one when its supply of fulminates is exhausted. That this is an eminently practical device, quite dissimilar from the numerous failures which have been put forth in this field, is well attested by the fact that more than half a million of them have already been sold, and the demand continues.

The Philosophy of Skating.

Considerable time and ingenuity has been expended this year in the effort to produce a form of skate which will combine lightness and convenience of arrangement with great speed. The scientific principle involved in this work is far more complex than is generally supposed, and makes a very interesting study. Speed in skating is of course attained by the proper application of every particle of motive power. When the skater strikes out with his foot he does not, however, as is generally supposed, obtain momentum from the broadside pressure of the skate on the ice. The momentum is gained by a gradual and tapering pressure which commences at the head of the skate, since it is here that the freshest and strongest force is applied. It will be seen that the momentum is increased, therefore, by the pressure exerted steadily and firmly outward from the heel of the skate to the extreme toe. The proper way to attain great speed is to strike out each foot as close to the other as possible, to continue the stroke up to the toe, and when once the extreme motive power is passed, to get the other foot in position as quickly as possible. The prime factors in producing speed, it will be seen, are the full pressure on the ice and the rapid movement of the legs. Working upon this theory, a long heavy skate has been manufactured, with a blade which extends several inches beyond the foothold.

Curious Artificial Fuels.

The Patent Office at Washington has at present a very curious assortment of contrivances patented for cheapening the cost of fuel. Some of the ideas are exceedingly interesting. One patent provides for using corn cobs soaked in petroleum, another would have people cut leaves and grass when green and press them into compact blocks. It is claimed for this particular patent that such blocks might be used for building and fencing without impairing their value as fuel. There are, besides, many devices for utilizing coal dust. One proposes to mix clay, molasses and water, coal dust and petroleum. Another mixture is that of saw dust, Irish moss, asbestos fiber and burnt limestone, these being boiled and made into bricks with coal dust. Then there is a patent for bricks without coal dust, to be composed of ashes and sawdust saturated with petroleum and coated with resin. Among the most curious ingredients for artificial fuels are clam shells, charred garbage, corn meal, wheat flour, sugar, sea weed, broken glass, lard, tar and leaves.

One of the most interesting of these contrivances is composed of powdered charcoal and finely cut cork. The fuel burns very slowly and gives off a great deal of heat, being particularly well adapted for the sick room. Exclusive rights have been taken out for the manufacture of a brick or cartridge of highly porous clay, which is to be soaked in kerosene and put in the kitchen stove when wanted. It is only necessary to touch a match to this and the fire is ready for cooking. None of these, however, are more ingenious or economical than a fuel which is reported to be in use at present in Egypt. In this case Egyptian mummies, chiefly those of cats, ibises and other animals held sacred by the ancients, are employed.

Essentials in a Healthful Home.

The site for a house should receive careful attention of the tenant, purchaser, or of one proposing to build. A good site may mean life and happiness, and a bad one disease, suffering and death.

First.—It should be dry. Avoid, as you would death, a damp location. In a town or city carefully ascertain whether or not it is on "made ground." Avoid it. Avoid ground underlaid with clay, for it will always be damp.

Second.—Elevated on a hillside or gentle knoll, never in a hollow. The hillside is warmer and drier than the hollow.

Third.—Not close to a swamp or slow river, milldam or land which is overflowed a portion of the year, nor in such a place that the prevailing winds will bring to the house pestilence from a milldam, etc.

Fourth.—In as good a neighborhood as possible, away from factories, saloons, etc., and near schools and churches.

Fifth.—In a village or town build on as large a lot as possible, thus securing air and sunlight. Build back from the street, thus avoiding the dust of the dry season and the curious gaze of every passer. Secure a yard in which trees and plants will furnish both exercise and health.

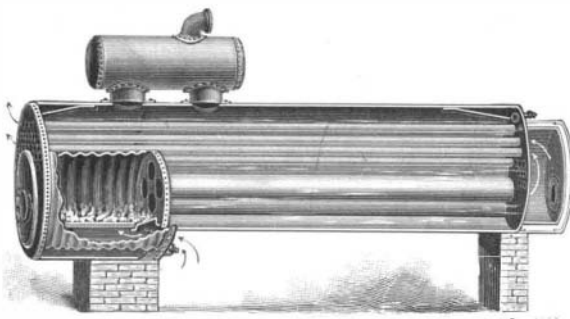
Sixth.—In the country build back from the highway, giving an abundance of room for trees and shrubbery about the house. Do not select a place where your family will be isolated from all social intercourse, so necessary to the health of mind and body.

For the aspect, let the house be so placed that it will receive the most sunlight and fresh air, especially from the summer winds. Avoid, even if offered rent free, a damp, dark house, with no chance of the free

all the rooms will be bathed in light and warmth. The living rooms should always be warmed by the morning sun. This hint is worth a great deal as a health matter. For when the sun cannot enter, the doctor must enter. If the cold winds from the north and west are severe in the winter, they may be broken by a cluster of evergreen trees planted on those sides. In country places a good aspect should be secured without reference to facing the house square with the street.—Pacific Health Journal.

AN IMPROVED STEAM BOILER.

In the boiler shown in the illustration the fire box as well as the entire body and barrel of the boiler are cylindrical, the improvement being designed to render the boiler more safe and less expensive in construction than the usual locomotive and marine boilers. For this invention a patent has been granted Messrs.



WALTZ AND PATTON'S BOILER.

George H. Waltz and Lucius E. Patton, Memphis, Tenn. (address in care of U. S. local inspectors). From the front cylindrical shell extends rearwardly a barrel of smaller diameter, the fire box in the front portion being circular, and either corrugated or having re-enforcing rings. In the front head is riveted a collar through which the shell of the furnace extends, its rear portion being located in an intermediate head, from which four or more large flues lead to a firebrick or tile-lined smoke box. The larger shell forming the front portion of the boiler and the main barrel are connected by means of a throat, the parts being preferably joined by hollow stay bolts, through which air is supplied below the grate and in front of the gases passing into the large direct flues. In the sides of the front shell are tubes of different diameters, capped to exclude cold air, these tubes taking up the surplus space and acting as stays from the front head to the throat. In both ends of the hollow standards connecting the steam drum with the boiler are sieves, to prevent moist steam entering the drum, and perforated pipes, below the furnace, close to the bottom of the shell, are connected with blow-off valves, to take up and remove sediment from the full length of the bottom. With this construction the furnace, fire tubes, and flues are entirely submerged beneath the water of the boiler.

A SUSPENSION BRIDGE BREAKS DOWN.

The great tempest which visited France on November 14 ruined the bridge known as "Pont-Lorois," situated on the River Etel, on the route from Port Louis to Auray, in the district of Lorient. At the northern end of the bridge part of the iron suspension ropes which secured the roadway to the cables were broken, and a large section of the roadway assumed the

The Electric Welding Patent.

In the United States Circuit Court for the Eastern District of Wisconsin, in the case of the Thomson Electric Welding Company against the Two Rivers Manufacturing Company and others, the action was a bill in equity by the Thomson Company against the Two Rivers Company and others for infringement of certain patents for electric welding. Complainant moved for a preliminary injunction. In his decision Judge Seaman said:

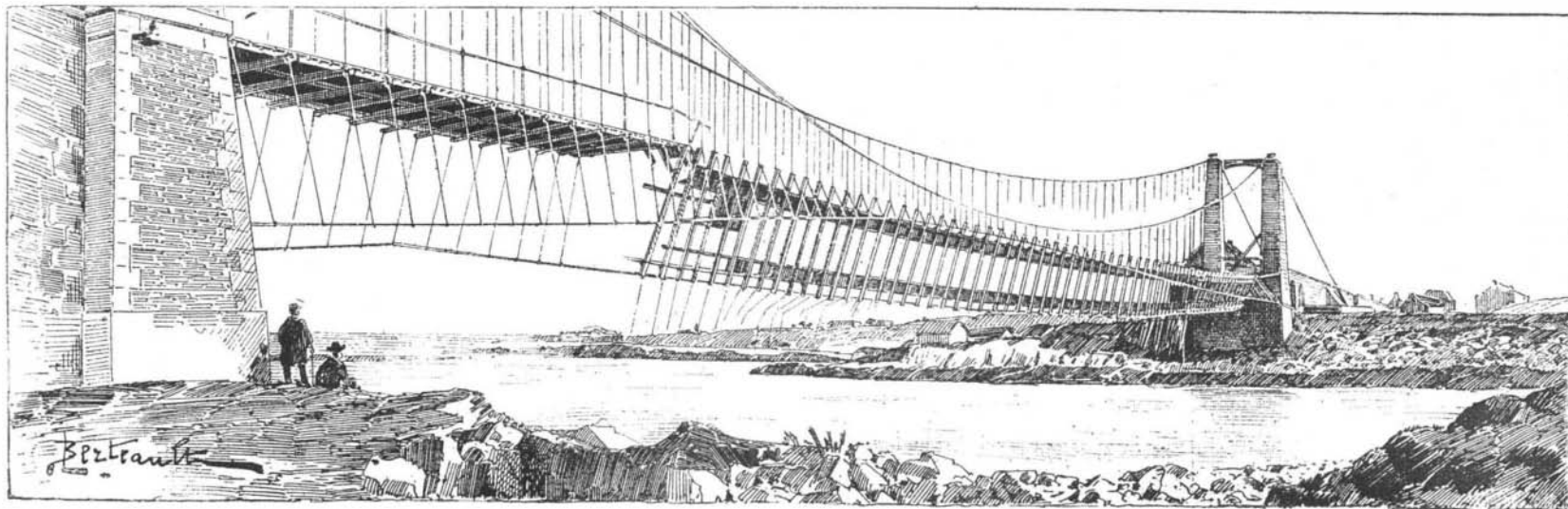
There has been no adjudication of the validity of these patents, and, so far as appears, no opportunity has arisen heretofore for testing their validity. Has there been public acquiescence in the claims here asserted of sufficient definiteness and duration to afford presumption of validity? This inquiry must depend in each case upon all the circumstances shown. Here was clearly an assertion of a new art and apparatus for welding.

Its discovery was widely published and accepted by the scientific world in Europe and America and by the public generally as novel and important. It was speedily put into operation by the complainant, and its machines and rights for their use were at once sought by manufacturers and metalworkers, and it is unquestioned that the process had extended to an important share of the welding of metals throughout the country when the defendants entered upon its use. With an asserted invention of this character and utility and operation under it firmly established since 1888, and to a considerable extent supplanting the older methods, I am satisfied that there is a sufficient showing of public acquiescence and that "there arises such presumption of the validity of the patent as to entitle them to a preliminary injunction to restrain its infringement, unless the party sought to be restrained can clearly show its invalidity." (Blount vs. Societe Anonyme, 3 C. C. A., 455; 53 Fed. Rep., 98; Sargent vs. Seagrave, 2 Curt., 553; Fed. Cas., No. 12,365; Sessions vs. Gould, 49 Fed. Rep., 855; 3 Rob. Pat., secs. 1185-1188.)

The remaining question is whether the defense have given a clear and convincing showing, first, that the invention was merely the double use or analogous use in the art of a process previously known; or, second, that it was fully disclosed in previous publications or patents and actually practiced as a welding operation prior to these patents, which should be held to overcome these presumptions and re-enforcing affidavits produced by complainants. Great research and ingenuity appear in this defense, but I am constrained to the opinion that neither proposition is maintained to the degree required for preventing an injunction, and that their determination must be postponed to final hearing.

They present the story frequently interposed against valuable patents of laboratory experiments, of announcements, and of patents which may have come to the verge of this discovery; but the demonstrations are not clear, and the important fact stands in their way that they do not appear to have accomplished the electric weld which is shown by Thomson.

The employment of heat and pressure for the operation of welding metals is old, and it was long known that heat could be obtained by the application of an electric current. These were not Thomson's discoveries, but he found a method for employing the electric current, localizing the heat at the joint to be welded, and applying simultaneously the requisite pressure, so that the separate pieces of metal could be properly united. I am not satisfied, for the purposes of this motion, that he was anticipated in this by Despritz, Joule,



THE LOROIS BRIDGE OVER THE RIVER ETEL, INJURED BY A STORM.

air of heaven to sweep through it. If the house is only one room deep, it does well to face it to the south or southwest; but if it is two rooms deep, those on the north side never receive any sunlight, and are apt to be damp. For a double house it is best to face it to the east. Then the morning sun will warm up the front and the afternoon sun the rear of the house, and thus

position shown in our engraving, the boards having been torn off. Fortunately this accident did not result in the loss of life, though it occurred at half past eleven in the morning. The bridge is 110 meters long (360 feet) and is 12 meters from the water at high tide and 17 meters at low tide. We are indebted to L'illustration for our engraving.

Plante, Cruto, or any of the patents shown, or by any experiments of Daft or Johnson. In this view the complainant is entitled to an injunction pendente lite against infringement of letters patent Nos. 347,140 and 347,141, and injunction will issue thereupon. With reference to letters patent No. 385,022, all determination will be postponed to final hearing.