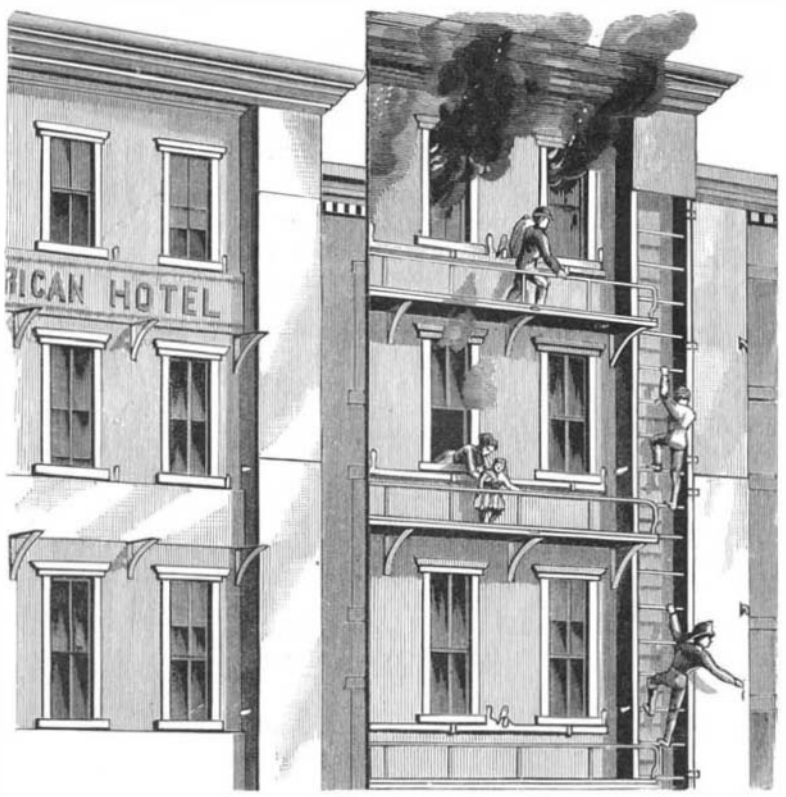
A NEW FIRE ESCAPE.

The balconies below the windows of the several stories of the building are constructed so as to lie in a fixed horizontal position or to fold up against the wall of the building. The ladder connecting the several balconies with each other and with the ground, for the escape of the occupants of the building, is arranged in a casing set up along the ends of the balconies. The front or door of the casing is made in sections of about the height of the respective stories, and each section is furnished with a spring latch to lock upon a catch of a rod supported along one side of the case. The latches are so constructed as to be automatically locked on the rod when the doors are closed, and to be unlatched by a vertical movement of the rod, which has an arm projecting toward each balcony. By this means the rod may be lifted from either balcony, and will simultaneously unlatch all the doors, permitting access to the ladder from any part of the building. A single door, provided with several latches, all of which catch upon the bar, may be used. The ladder can be used without the balconies, the arms being operated from the window of any story. This plan makes a fire escape which is always in place, and which can be quickly and easily operated from any story in the building.

This invention has been patented by Mr. Robert Stevenson, of Muskegon, and further particulars may be obtained from Mr. Charles Stroebe, of Ferrysburg, Mich.

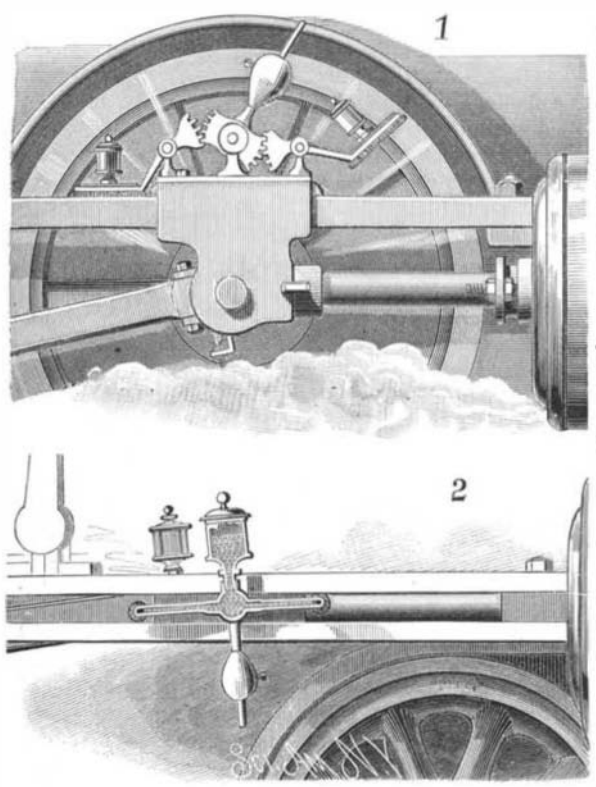


STEVENSON'S FIRE ESCAPE.

GUIDE BAR OILER.

The accompanying engraving represents an invention, lately patented by Mr. John S. Park, for oiling the cross head guides of steam engines, and also the guides of other reciprocating parts of machinery. Held to the cross head is a base plate, to which are secured three standards. To the center standard is pivoted a head having projecting side pieces furnished with gear teeth, and having a central stem carrying a weight which may be held at any desired height by a set screw. On each side port is pivoted an arm carrying at one end a segment plate having teeth meshing with those of the head, and at the outer downwardly bent part of the arm is a plate, to the under side of which is secured a wiper made of any suitable soft material. This distributes over the face of the guide the oil fed to it from an oil cup carried on the back of the plate. The gears are so intermeshed that a rocking motion of the weighted stem will raise one of the oiling heads from and lower the opposite one to the guide bar.

At the end of each stroke the inertia of the weighted stem, combined with the motion of the cross head, shifts the oilers, so that one of them will always be in advance of the cross head. Not only is the upper face of the guide kept oiled, but it is also kept free from dust or grit, which would, if not removed, unduly wear the surfaces. The same principle of rocking the opposite oiling heads into contact with the guide bars is shown in Figure 2. A four-armed head, made hollow to carry oil from the cup to the oiling heads, is pivoted to each side of the cross head. The operation of this will be plainly understood from the cut.



PARK'S GUIDE BAR OILER.

Further information regarding this novel device may be obtained from Messrs. Park, Basye & Weil, of Rockport, Ind.

OF the 27,672,048 inhabitants of France, 1,109,090 are foreigners, of whom 432,265 are from Belgium, 240,733 from Italy, 81,986 from Germany, 73,781 from Spain, 66,281 from Switzerland, and 37,066 from the British Isles. The number of naturalized persons is but 77,046.

Fireproofing of Wood.

Several preparations exist which render wood impervious to heat, and also increase its durability. Some of these solutions have been tested on a large scale, and have proved a success. Although these measures are cheap and their success demonstrated, they have, with few exceptions—as, for example, at Frankfort-on-the-Main, the Hof Theater at Berlin—not being employed. Perhaps constructors of theaters will, in view of these frequently occurring catastrophes, at last comprehend that even the incombustibility of the woodwork would be of inestimable value in securing immunity from fire in theaters, and that the spreading of flames would be greatly retarded when, instead of burning rapidly, as dry wood will, it slowly, without flames, chars into coal. The nature of wood makes it an easy matter to change it into what an exultant chemist has called a "fireproof" substance. On account of its porosity a solution applied to its surface sinks deeply into its pores, thereby attaining a firm hold, and on account of its rigidity exposes the covering to abrasion only. Care should be taken, where such solutions have been used, to replenish them from time to time, so as to keep the wood entirely covered. It may be well to state here what is meant by "fireproof." As this term is usually used, it signifies the property of remaining intact in high temperatures such as are produced by the conflagration of buildings; but this is not the state impregnated wood or scenery is in. These are destroyed when in contact with a flame; not, however, by burning, but by charring. If we hold a piece of impregnated scenery in the flame of a Bunsen burner, we will find that the part which was in contact with the flame has been destroyed, that is, it has been charred without producing flames or injuring the parts not in direct contact with the gas flame.

In experimenting on the impregnation of wood, canvas, and gauzes, I was particularly careful to use only chemicals as they appear in commerce, and undistilled water. In my opinion one of the chief causes of failure in methods in practice which were successful in experiment, is that the chemicals employed in experimenting were the pure reagents of the analytical chemist, while those used in practice contain many impurities which must necessarily alter the results arrived at by purer supplies.

One of the oldest and best known processes is the coating of woodwork by water glass (sodium tetra-silicate), which for a short time gives good results, but soon the covering drops off. The reason for this is that a covering of water glass is as brittle as ordinary glass, and is readily cracked and broken; and secondly, as it dries very rapidly, it does not enter any distance into the pores of the wood, but rests on the surface. Any jar or abrasive action will, therefore, cause the water glass to drop off in small chips. Another objection to this substance is its solubility. It cannot be employed in places exposed to the action of water.

Another process is to paint wood with a solution of three parts of alum and one part of sulphate of iron; after the wood has received two or three coats of this solution, it is thoroughly dried; then a solution of potter's clay and sulphate of iron, having the consistency of paint, is daubed on the prepared wood until all pores are filled, and a thin layer remains on the surface. It is claimed that in this process the alum and sulphate of iron enter deeply into the fibers of the wood, and form indestructible compounds with the chemical elements of the fibers, which cling tightly to them and cannot, as in the case of water glass, be readily washed out. The covering of clay greatly protects the wood from moisture, so that the first solution cannot be washed out or thrown out by the action of frost. This sounds well, but in practice would be too complicated.

Another objection which makes it valueless for theaters is that the clay on the surface comes off very readily in the form of dust, and, therefore, must frequently be renewed; it is also an unclean process; an actor unconsciously leaning against a piece of wood thus prepared would afterward appear before the audience with a stripe of clay dust on his back.

The following is also a complicated process: The wood is painted with hot glue water until all pores are filled, the number of coats depending on the porosity of the wood used. Then applying to the surface, before the glue dries, a powder consisting of one part of sulphur, one of ocher (or clay), and six parts of sulphate of iron. Care should be taken to powder and mix these substances well before applying them. This process labors under the same difficulty as the preceding one described.

A clean and excellent coating for wood is asbestos paint, or better still, the thicker asbestos concrete. These substances act like true paint, adhere tightly to the wood, give good protection against high temperatures, and do not readily rub or chip off. It has but one objection, that is, its solubility in water; it cannot be used in places exposed to the action of water, but for interior theater purposes this is no material objection. Great care must be taken in purchasing this article, and it should always be tested before being used, as much of the so-called "asbestos paint" which is sold is entirely worthless.—*C. John Hexamer, in the Spectator.*

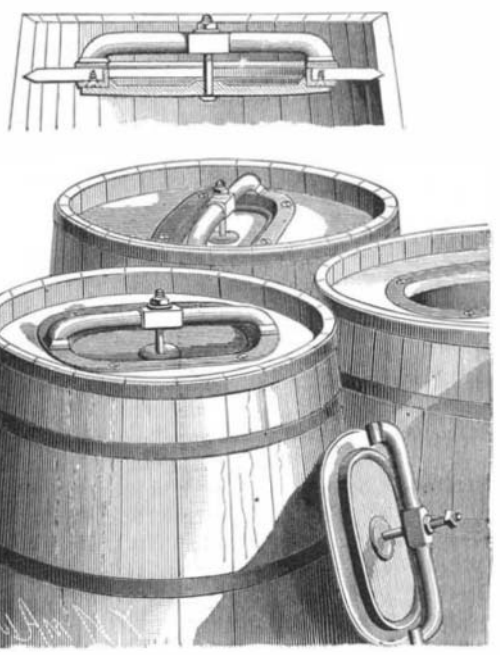
Our Patent Laws and Foreign Manufacturers.

A Philadelphia manufacturer writes us that, in 1882, he sold out his business in England, and has since been manufacturing here, selling his goods to American consumers at lower figures than they were formerly imported for. He came to this country on account of the better protection afforded by our patent laws, and is the owner of many widely used patented inventions, while also engaged on further labor-saving devices in connection with woolen, worsted, and silk spinning; but he says he shall most certainly decline to make known here in what any of these improvements consist, should there be any danger of Congress so changing the law that the public might immediately rob him of the fruits of his labor.

HEAD FOR BARRELS, CASKS, ETC.

An elliptical opening is formed in the head of the cask, in which fits a flanged curb held in place by screws; between the curb and head is inserted packing in order to form an air tight joint. A flanged plate of about the same form and external size as the curb fits within the curb, and is furnished with a central screw bolt by which it is held in place in the curb by means of a cross piece through which the bolt passes. Packing is placed between the plate and curb. Upon the upper edge of the curb is placed a flat, elliptical ring which serves as a chafe plate for the ends of the cross piece to rest upon, and also makes a nice finish to the head. The construction and arrangement of the several parts will be readily understood from the engraving.

To open the cask it is only necessary to remove the nut from the upper end of the bolt, when the cross piece may be removed and the plate taken out of the cask by passing it endwise through the curb. The cask may be very easily



MORAN'S HEAD FOR BARRELS, CASKS, ETC.

opened and closed without removing the head, and can be closed perfectly airtight; the parts are strong and durable, and can be cheaply made.

Additional particulars may be obtained from the inventor, Mr. Patrick Moran, of 443 Water Street, Bridgeport, Conn.

EXPERIMENTS made with gases upon insects proved the Colorado beetle hardest of all. It took prussic acid vapor to kill it outright, and was paralyzed in illuminating gas.

A Japanese Engineer.

T. A. Matsdaira, the new City Engineer of Bradford, Pa., is a native of Japan, and the first man of his nationality to be chosen to a civil office in the United States. He is the son of a wealthy Japanese nobleman, and came to this country in 1870 to be educated, not at the expense of his government, but at the individual expense of his father, who planned to have his son return home and be appointed to a high position under the Japanese Government. Upon being graduated he asked consent to remain a few years longer to practice civil engineering. His father replied that unless he came home on the next steamer his allowance would cease, and he need expect no more help from him. The son replied that he would stay, and the father became angry and wrote to his Japanese friends to have nothing to do with the young man. He staid and practiced his profession, acting for some time as assistant engineer of the Manhattan Elevated Railroad Company in this city, and afterward for three years as chief engineer of the Union Pacific Railroad in Wyoming, Idaho, and Montana.

TAKING A PHOTOGRAPH BY THE MAGNESIUM LIGHT.

Taking portraits at night by the electric light is now a matter of every day occurrence, and has many advantages, but as an experiment it is too expensive for the amateur photographer to undertake.

Our engraving illustrates a novel and easy method of photographing by the aid of the magnesium light. If a magnesium ribbon of a certain length be used, the ash will sometimes drop and suddenly extinguish the light.

This difficulty may be overcome by the use of magnesium powder mixed with fine sand. Upon a metal or wooden rod six or eight feet long is clamped an alcohol soldering lamp capable of giving a large horizontal flame, and above it a funnel of tin or brass with a short mouth about three-quarters of an inch in diameter. The lamp should be quite close to the funnel; the rod may be secured at the bottom to any suitable base of wood or metal, and may rest upon a table instead of the floor. A pan or dish set upon the base will catch any falling particles.

The proper focus may be obtained by focusing upon the flame of a candle placed where the person is to sit. The shadows are softened by reflecting the light with a white muslin screen secured to a frame which may be tilted at any angle, as shown. No cap is used on the lens.

One thimbleful of magnesium powder is mixed with two of fine sand, with a spoon or piece of wood upon a white sheet of paper.

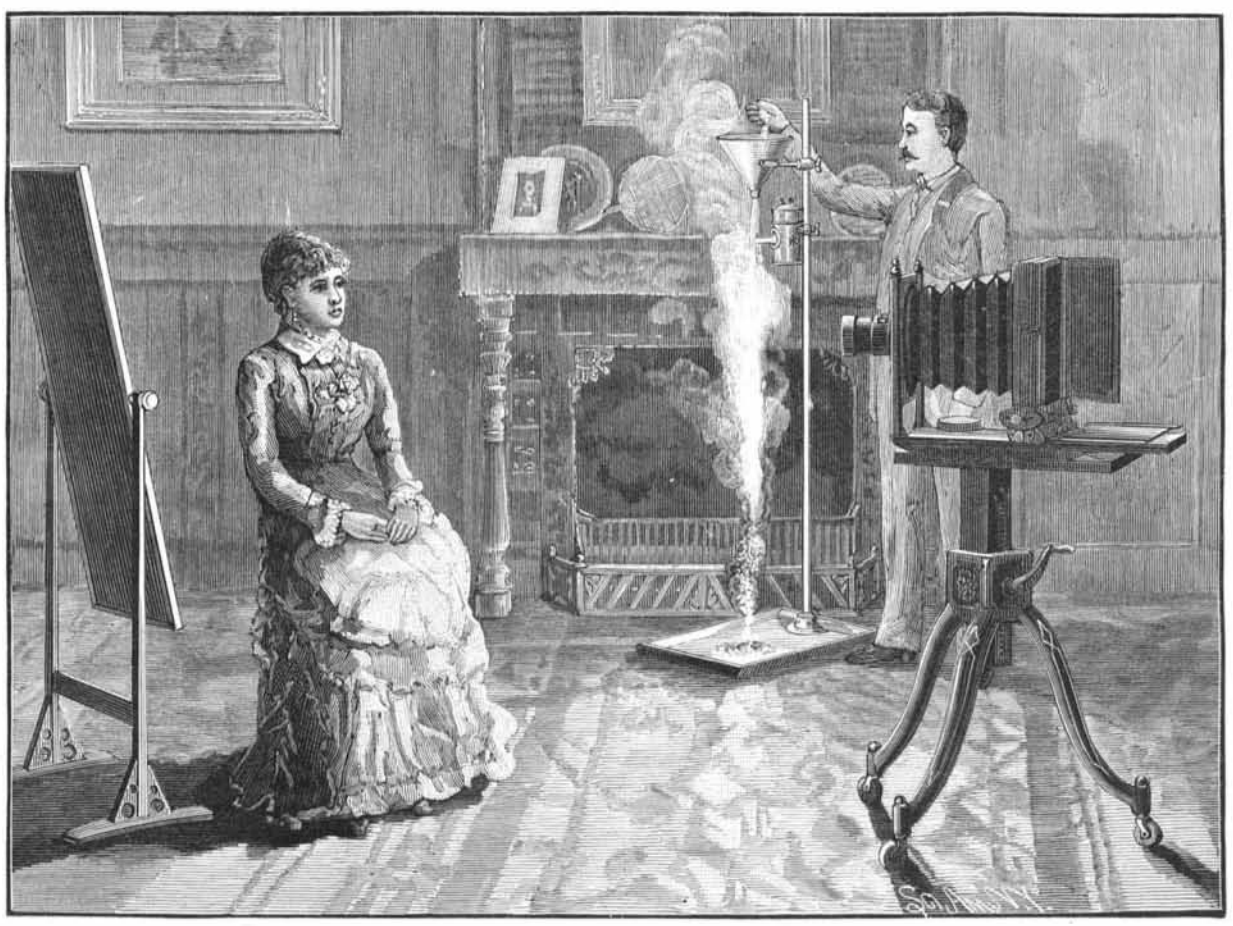
To make the exposure the operator, after fixing the sitter in position and drawing the slide of the plate holder, simply steps up to the funnel and quickly dumps the magnesium mixture into it. The alcohol lamp sets fire to the magnesium as it, in falling, comes in contact with the flame, and a long, brilliant, dazzling sheet of light, lasting for a second or two, is the result. Such a brief exposure is generally sufficient. The duration of the flame can be regulated by the addition or subtraction of the magnesium or sand.

Should a picture be over exposed, the duration of exposure can be shortened by the addition of a little sand and a corresponding diminution of magnesium powder. If a larger amount of magnesium is used in proportion to the sand than that stated, the light will be more brilliant and of short duration. By varying the proportions of the two, it is possible to produce a flame of light from six to seven feet in length.

The large area of the light tends to diffuse the same, softens the shadows, and gives to the picture a brilliant effect.

By varying the position of the light, very artistic effects of light and shade may be produced. The sitter should be placed so as to look away from the point where the light is to appear, in order that the dazzling effect of its intense glow may be avoided. Once the proper proportion of magnesium powder has been ascertained, several exposures may be made one after the other, with the certainty of obtaining good pictures each time.

As an experiment nothing can be more attractive and entertaining than taking a photograph at night.

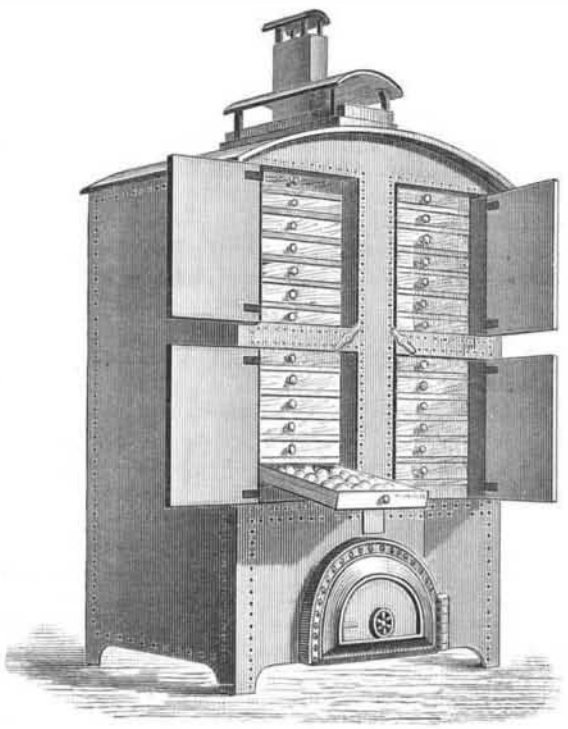


PHOTOGRAPHING BY THE MAGNESIUM LIGHT.

METALLIC paper is a recent French invention, and chromolithographs are rendered transparent by a coating and backed with tinfoil. The effect is said to be very striking, and the applications are very numerous.

APPARATUS FOR DRYING FRUIT.

Mr. Baltet, of Paris, has recently published a very interesting work upon the "Cultivation of fruit for market and family use," and it contains so many good hints and such instructive drawings that we have taken the liberty of reproducing one of his illustrations, showing a very simple but highly practicable apparatus for drying apples and kindred fruit. The work treats principally of matter relating to propagation of fruit yielding trees and plants, and gives useful hints as to proper culture of trees from a commercial point of view.



APPLE DRYING APPARATUS.

Mr. Baltet says further that it is not enough to know simply how to grow fruits; but he emphasizes quite properly the care which is necessary in collecting and gathering the fruit and preparing it for transportation, and also for the proper preservation of the fruit until the season for the same is past, when the fruit can be put upon the market, commanding in this way higher prices than when the supply is surfeited. The annexed engraving represents an evaporator or drying stove for bringing apples more especially into condition in which they may be preserved for several years, and thus avoid the tremendous waste which accompanies every season that we have of especial abundance. Nearly every fruit farm in France possesses apparatus more or less similar to one shown in the engraving.

It is believed that a bushel of fresh fruit will yield about six pounds of the dried fruit. The construction of the drier may be seen at a glance, and consists simply of a closed chamber provided internally with tiers of drawers, and with a stove located at the base, so that the heat as it ascends will pass over the fruit as it lies on the shelves, while a circulation of pure air is constantly kept up through the opening at the top of the chamber. We quote a few words in conclusion: "Everywhere the culture of fruit trees is making progress, and if we cross the Atlantic we shall see it developing itself there in an extraordinary degree. The people of the United States, who devote to their orchards an area of nearly 5,000,000 acres (representing yearly 300,000,000 dollars), in 1883, at the close of so many other congresses, convened a special meeting for the discussion of the different modes of packing and transporting fruit. Let us, then, prepare ourselves for the struggle. The New World means to swamp our markets with her fruits, as she has already tried to do with her corn and meat."

A California Gas and Water Well.

Cutlar Salmon lives near French Camp, a small settlement nar far from Stockton, Cal. Others had been boring artesian wells, and he determined to try his luck. He sank a well with a seven inch tube to a depth of about 840 feet, and struck a copious stream of excellent water. Desiring to learn whether he could increase the flow by going deeper, and fearing that, should he continue the well the same size, he might injure the quality of the upper strata of water, Mr. Salmon hit on the plan of sinking a four inch tube inside the seven inch one, and then making what might be called the experimental well, four inches in diameter. This inner one he bored to a depth of 1,250 feet, and then came to water again. This lower stream came to the surface, and, indeed, rose in a tube twenty-two feet above the ground. This last water found was unfit for drinking, and but for an accidental discovery of its wonderful properties might have been considered a nuisance, as are many things the uses of which we do not know. It was found that there was a large amount of gas in this water from the lower depth. This came bubbling to the surface, making one think of a gigantic soda fountain. Some one suggested the idea of seeing if the gas would burn. A coal oil can was put over the top of the tubing, and having a few holes punched in it, an improvised gas fixture was in hand. Only a match was required to complete the preparations. The match was lighted and applied to a hole in the can, and the flame shot up three or four feet into the air, and burned steadily. The gas would burn. Mr. Salmon had fire and water coming out of the same hole in the ground.

The tube of the outer well, that which was only 840 feet deep and furnished the good water, was tapped, and sufficient water for all domestic uses, and for the stock, etc., was led off in pipes to the house and other localities. A curbing was built around the twin wells in such a way that it formed a reservoir for the water from the 1,250 foot level, and that portion from above which was not conveyed away in pipes. All through this water in the reservoir came bubbling up the gas, generated somehow somewhere down below. When Mr. Salmon next went to Stockton he had a gasometer made with a stop cock in the top, and this he took home and fastened over his wells. The bottom was beneath the surface of the water in the reservoir, and gas speedily filled the bell-shaped receiver. The next thing was to attach a gas pipe, and connect his homemade gas machine with the house. He put a pipe perforated with small holes across his large open fireplace, turned on the gas, applied a match, and the problem of cheap fuel was instantly solved. After that, gas pipe was put into the fire-box of the kitchen stove, and now the meals are prepared with the new fuel. Mr. Salmon has also used this gas for illuminating, but it does not seem to entirely fill the bill, although it is a great improvement on a tallow dip. It has been suggested that, as this gas seems to be almost pure hydrogen, it might be carbureted, and its illuminating qualities improved. But poor light or good, Mr. Salmon is certainly a lucky man, in that he gets his fuel so easily. The gas throws off a great amount of heat, and without doubt such a well would supply a large number of families with the means of warming their houses and preparing their food. Colonel Orr states that he has examined this well carefully, and thinks there is gas enough issuing from it to run a twenty horse power engine.—*San Francisco Bulletin.*

HUMAN skin and that of young rabbits have been successfully applied in small pieces to large healing surfaces in wounds. Dr. Wilson, however, in the *Medical News*, claims to have obtained very much better results from the use of the internal membrane of hen's eggs. The egg should be fresh and warm.