

A Japanese Engineer.

T. A. Matsudaira, 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.

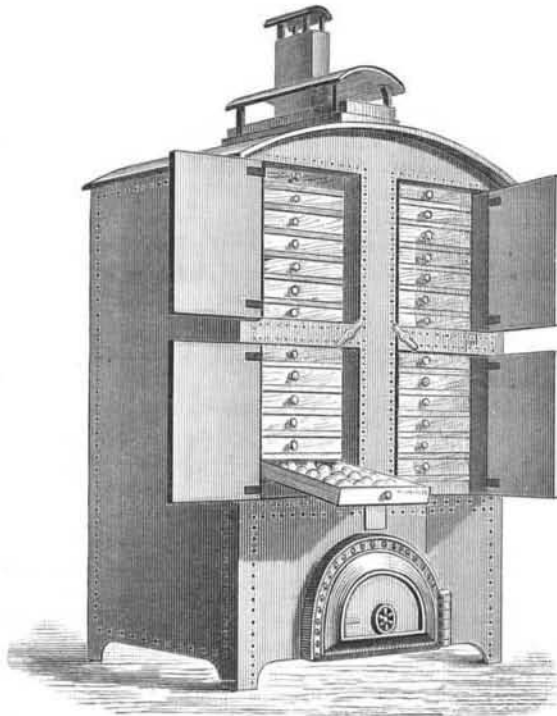
By varying the position of the light, very artistic effects of light and shade may be produced. The sitter should be placed so as to look away from the point where the light is to appear, in order that the dazzling effect of its intense glow may be avoided. Once the proper proportion of magnesium powder 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.

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.

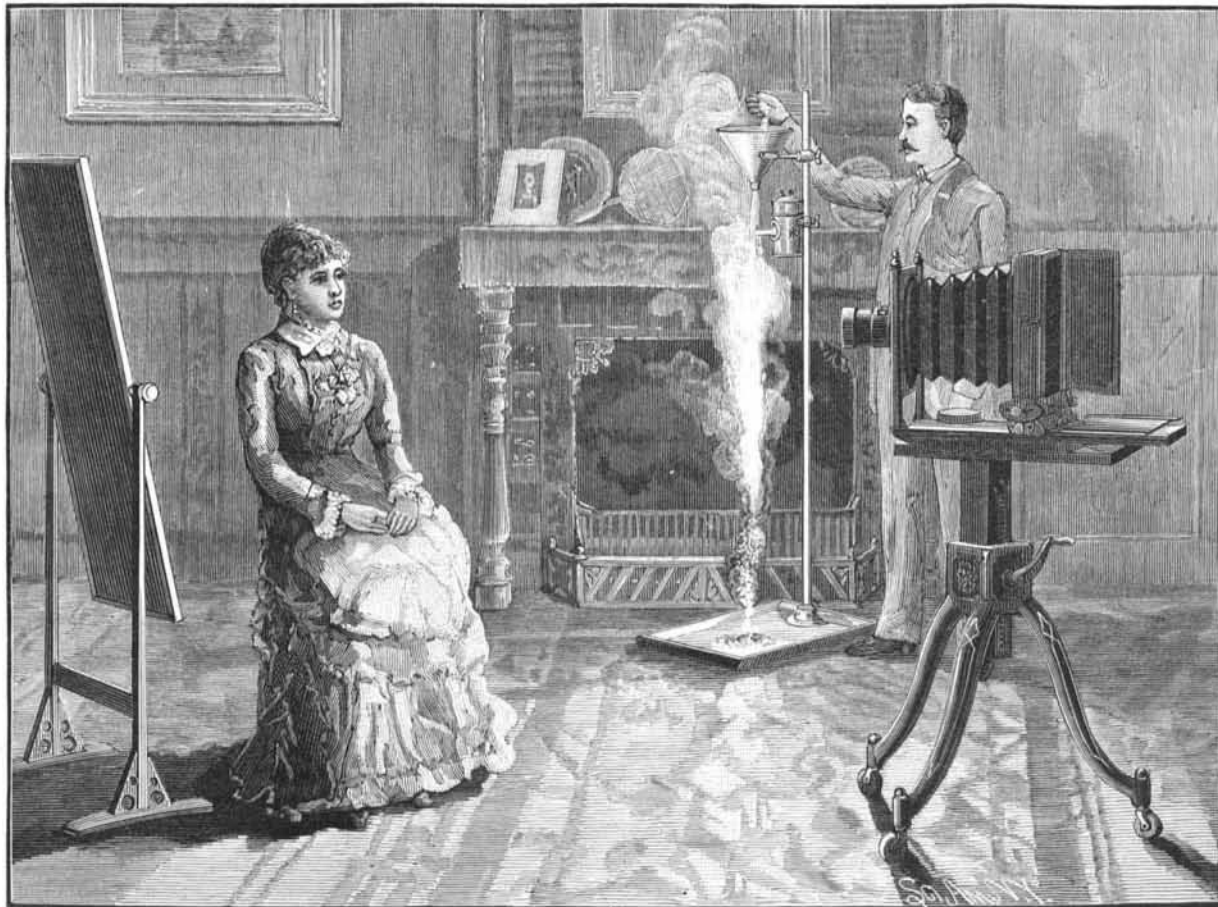
Mr. Baltet, of Paris, has recently published a very interesting work upon the "Cultivation of fruit for market and family use," and it contains so many good hints and such instructive drawings that we have taken the liberty of reproducing one of his illustrations, showing a very simple but highly practicable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



APPLE DRYING APPARATUS.

ful hints as to proper culture of trees from a commercial point of view.

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



PHOTOGRAPHING BY THE MAGNESIUM LIGHT.

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 near 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.