REMINISCENCES OF DAGUERREOTYPY.

(Continued from first page.)

rouge. Scrupulous cleanliness was imperative in every step of the process.

The buffs were kept clean and dry, when not in use, by inclosing them in a sort of vertical tin oven, which was warmed by a small spirit lamp. A careful operator would prepare a plate having a bright black polish without a visible scratch, while an incompetent or careless man would fail in this part of the process, and would prepare plates full of transverse grooves and scratches. The beauty of the picture depended very much on the careful preparation of the plate.

Occasionally, a buff would in some manner receive particles of matter which would cause it to scratch the plate. The remedy consisted in scraping the face of the buckskin, and brushing it thoroughly with a stiff bristle brush, generally a hair brush devoted especially to this use. The buff was then recharged by dusting on rouge from a muslin bag.

When the rotary buff wheel was adopted, it insured rapid work, but it was otherwise no improvement over the hand buff. At first, the wheels were made cylindrical, but that incurred the necessity of an objectionable seam or joint where the leather lapped. The conical buff wheel (Fig. 3) allowed of the use of a whole skin, thereby dispensing with the seam.

After buffing, the plate was taken to the dark room to be sensitized. The room had a side window, generally covered with yellow tissue paper, for the examination of the plate during the process. The room contained two coating boxes, one for iodine, the other for bromine. The construction of these boxes is clearly shown in Fig. 9, which is a longitudinal section of one of them. The two boxes were alike except in the matter of depth; the bromine box being about twice as deep as the iodine box.

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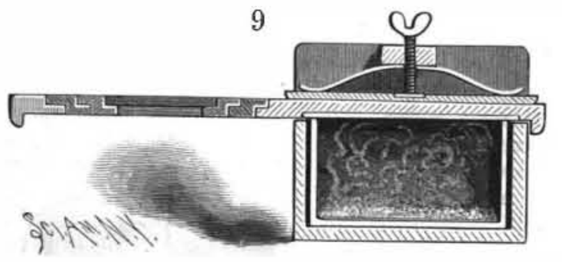


THE COATING BOX.

Each box contained a rectangular glass jar having ground edges. In the top of the box was fitted a slide more than twice as long as the box. In the under surface of one end of the slide was fitted a plate of glass, adapted to close the top of the jar, and in the opposite end of the slide was formed an aperture, furnished with a rebate for receiving the plate. Upon the top of the slide was arranged a spring-pressed board, which held the slide down upon the top of the jar.

On the bottom of the jar of the iodine box were strewn the scales of iodine, and in the bromine box was placed quicklime charged with bromine. The bromine was added to the lime drop by drop, and the lime occasionally shaken until it assumed a bright pink hue bordering on orange. The lime was thus prepared in a glass stoppered jar, and transferred to the jar of the coating box as needed; one inch being about the depth required in the coating box. The polished plate was placed face downward first in the slide of the iodine box, and coated by pushing in the slide so as to bring the plate over the iodine in the jar. It was there exposed to the vapor of iodine until it acquired a rich straw color, the plate being removed and examined by the light of the paper window, and replaced if necessary to deepen the color. The plate was then in a similar manner subjected to the fumes of the bromine until it became of a dark orange color. It was then returned to the iodine box and further coated until it acquired a deep brownish orange color bordering on purple. The time required for coating the plate depended upon the temperature of the dark room. The process was very rapid in a warm room and quite slow in a cool room.

The plate, rendered sensitive to the light by the thin layer of bromo-iodide of silver, was placed in a plate holder, and exposed in a camera according to the well known method. The time of exposure was much longer than that of modern photography. A great deal depended on the quality of the lenses of the camera. The exposure in the best cameras was reasonably short. The old time gallery, with its antiquated camera and fixtures, and the dark room with the appurtenances, are faithfully represented in the engraving. After exposure, the plate was taken to another dark room for development. It was placed face downward over a flaring iron vessel, in the bottom of which there was a small quantity of pure mercury. The mercury was maintained at a temperature of 120° to 130° Fah. by means of a small spirit lamp. The temperature was measured by a thermometer attached to the side of the vessel. The plate was raised occasionally and examined by the light of a taper, until the picture was fully brought out, when it was removed from the mercury bath and fixed.*

The fixing consisted merely in flowing over the plate repeatedly a solution of hyposulphite of soda, having sufficient strength to remove in about half a minute all the bromo-iodide of silver not acted upon by light. The plate was then thoroughly washed, and afterward glided or toned by pouring upon it a weak solution of chloride of gold and heating it gently by means of a spirit lamp until a thin film of gold was deposited upon the plate and the picture attained the desired tone. The plate was then washed in clean water, and finally dried evenly and quickly over a spirit lamp.

This operation added to the strength and beauty of the picture, and also served to protect the surface of the plate to a great extent against the action of gases.

The finished picture was protected by a cover glass, and the edges of the glass and plate were securely sealed by a strip of paper attached by means of an adhesive coating.

Brains vs. No Brains, and Hiring Steam Power.†

When a machine won't work, the first thing to do is to determine just where the difficulty lies, and what the trouble is. Experience can give odds in this line, and the young mechanic especially must have all his faculties alert to "catch on" to the defective locality.

Go to any first-class watchmaker, and he will tell you that the first and most difficult step in watch repairing is to find what the trouble is. The same applies to larger machinery as well, and the more complicated the mechanism, the more difficult to locate the trouble.

Let two men attempt to "fix" two machines which are "out of-kilter." Let both men be young mechanics, to whom the machines are strange. The character of the two men will be as plainly seen as if it was a printed book. One of these men will go at the job "hammer and tongs." He will hammer this part, screw up a bolt here, loosen a screw there, and rattle and tinker the parts of that machine without even knowing what he does, or why he does it. Perhaps by mere chance he may strike the right lever, and hammer in the right place, thereby effecting a cure, but not by any skill of his own.

His brother workman, on the other hand, will do nothing of the kind. First, he will sit down beside the machine and look at it. He will study each part, see what every lever and cam must do, how they work, and if there is anything to prevent the performance of their duties, he finds it out without fuss or trouble.

This young man has used his brains for the purpose for which they were given him. He will continue to use them until he works himself into a responsible position, which he will fill with credit to himself and satisfaction to his employers.

The first young man, the "thumper," as it were, will knock around the world, much as he knocks around a machine which is above his comprehension. This is the kind of a man who comes on a job with a rush and a hurrah, and who sneaks off in the night, leaving things worse than he found them. He will work around the country, get jobs and get bounced from them when his incapacity is discovered, until some day he goes off for good, in a cloud of steam. Of such is the cheap engineer and the cut-rate workman.

The whole difference between these two men lies in the fact that one of them used his brains to the best of his ability, while the first young man rushed at the work without stopping to think.

Hiring steam power very often becomes a bone of contention between landlord and tenant, which gives rise to much discomfort, to say nothing of hard feelings. If the power could be readily measured, there would be less cause for dissatisfaction; but when the tenant is using but four horse power, and the landlord pays coal bills for twelve, then there is cause for grumbling, and grumbling there surely is.

The indicator card will tell how much power the landlord is furnishing, but it seldom tells how much a tenant is consuming, although by taking a card with tenant's belt off and taking a card with all his machinery at work, will approximate closely to the truth.

By placing a dynamometer on the tenant's shaft, it is easy to see how much power he is consuming at the time, but it is no indication of the power used when the landlord's back is turned. If the tenant be dissatisfied with the amount he is paying for power, let him put on a belt having a width proportionate to the power he thinks he is using. If the amount is estimated at eight horse power, then a belt eight inches wide, running 500 feet per minute, will do the work safely and well. If a six inch belt will do the work, the tenant may depend upon it that he is using only six horse power, and the width for any given speed will be in the same proportion.

A recording dynamometer is needed, which will tell at any time how much power is passing or has passed. In electrical transmission of power, such a device is in use, and works upon the principle that a given amount of current will deposit a given quantity of copper; therefore a small fraction of the current is led through an electroplating contrivance, and the ratio of the main and fractional currents being known, the amount of electricity furnished can be ascertained at any time by weighing the amount of copper deposited, and multiplying that amount by the ratio of the currents.

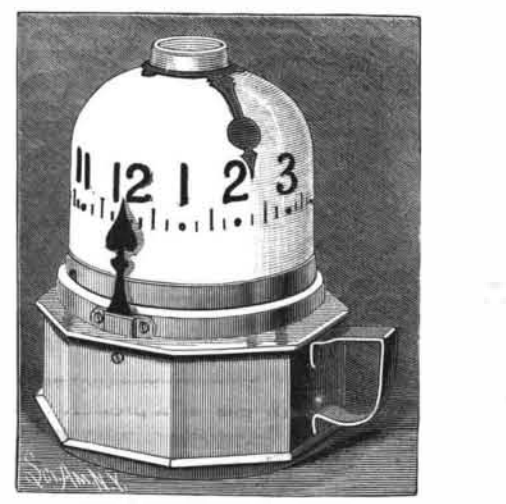
Some such device is used for power users and power sellers, and a device could probably be made in which the belt would transfer its energy to the shaft through a set of springs, the tension of these springs to be recorded on profile paper which is advanced a certain distance at every revolution of the shaft to which the device is attached. This paper could be figured up much like an indicator card, and all the foot pounds transmitted through the belt could be accurately determined.

* A fortunate accident led to the discovery of the development of the photographic impression by means of the vapor of mercury. Previous to this discovery, the image was brought out by a long continued exposure in the camera. Daguerre on one occasion placed some under-exposed plates, which were considered useless, in a closet in which there were chemicals. Afterward, happening to look at the plates, he was astonished to find an image upon them. After taking one chemical after another from the closet until apparently all were removed, the images on his plates were still mysteriously developed. At length he discovered on the floor an overlooked dish of mercury, and the mystery was solved. He ascertained that the effects produced by the mercury vapor spontaneously given off could be secured at will by suitable apparatus.

† James F. Hobart, in *The Manufacturers' Gazette.*

ILLUMINATED CLOCK.

The accompanying engraving represents a simple and practical device which embodies a day, night, and medicine clock, and which also provides a night light. Within the base is placed a clock mechanism, the hour spindle of which passes up through the center of the top and is secured to a dished plate, which is by this means revolved once in twelve hours. Resting upon the plate, and, of course, turning with it, is a dome-shaped globe of white glass, having the hours and quarter divisions marked distinctly in a circle upon its exterior. Secured to one side of the base is a pointer which extends to the row of figures. It is evident that as the globe revolves, the time will be indicated by the pointer. Within the globe is placed a small lamp, which serves to render the figures and pointer plainly visible, so that the time may be read at night, and also to illuminate the room with a soft and yet sufficient light. Adapted to rest on top of the globe is a second pointer, which may be placed at any desired distance in advance of the stationary pointer. This will be found of value in the sick room, as, when giving medicines, the second pointer can be placed the required interval between doses—say two hours—in advance of the other, the lapse of the time being noted when the pointers are together. By thus combining a lamp and clock, a most convenient and valuable article is produced.



AN ILLUMINATED CLOCK.

These clocks are manufactured by the W. C. Vosburgh Manufacturing Company (limited), of 418 Fulton Street, Brooklyn, N. Y., and 184 Wabash Avenue, Chicago, Ill.

Manganese as a Phosphorescent Agent in Minerals.

In a memoir read on December 6 before the Academy of Sciences, M. Becquerel came to the conclusion that the phosphorescence observed in some specimens of limestones is due to the presence of manganese. Having noticed, for instance, that Iceland spar is phosphorescent, he proceeded to the analysis of this substance, and found it to contain manganese. Then, experimenting with carbonate of lime, chemically pure, he tested it with the phosphoroscope, and found it almost inactive. When, however, small quantities of manganese are added to the liquors from which carbonate of lime is precipitated, an active phosphorescent compound is obtained. This phenomenon he considers due to a molecular change adduced in the precipitated carbonate by the presence of manganese.

IN the case of trees which bear in alternate years, judicious thinning will often result in considerable fruit in the off years.