

Miscellaneous Notes and Receipts.

Decolorization of Black Cotton Rags.—Aniline black is justly termed an indestructible color, and cotton rags dyed with it could heretofore only be used for the production of the coarsest wrapping paper. A paper manufacturer has caused chemists to seek a medium decolorizing such rags without weakening the fiber to a great extent. The experiment brought the following result: By the action of bisulphites on such rags at a high temperature the color changes from black to pale buff. If the stuff, pre-bleached in this manner, is exposed to the successive action of weak acid, clean water, and lime chloride solution, a material of such whiteness is said to be obtained that it can be utilized for writing paper and book paper.—*Papierzeitung.*

Impregnating Liquid for Incandescent Gas Light Mantles.—According to Invention, M. Salomonov, of Russia, has received a patent on an impregnating liquid for incandescent gas light mantles which effects a coloring of the light. Same consists of magnesium sulphate 12 parts (by weight), zinc sulphate 4 parts, potassium bichromate 1 part, or in its stead ammonium bichromate 1 to 5 parts, dissolved in distilled water 50 to 100 parts. To the solution are added some drops of a silver nitrate solution. The mantles are dipped in this liquid and dried. Such a mantle imparts to the light a pale red color, which can be intensified by the addition of a little stannic nitrate to the impregnating liquid. If an addition of platinum tetrachloride is substituted for the admixture of silver nitrate, the light will have a golden yellow color.—*Metallarbeiter.*

Important Invention in the Domain of Printing.—According to the Archiv fuer Buchdrucker Kunst, two Englishmen and a Frenchman have succeeded, after many vain attempts, in solving the problem of printing in different colors simultaneously. The process involved deviates entirely from the ordinary method of printing in colors. It is styled the mosaic-chromatic heat process. Neither wooden blocks nor lithographic stones or rollers are employed. The colors required for the picture are applied in any desired number on a plate about three-fourths of an inch thick and form a coherent, cheesy mass. When the arrangement of the colors is finished, the plate presents the aspect of a mosaic picture. The plate is placed on the bed of the machine, an ordinary lithographic press, but adapted to the process, and the impressions are produced by means of a cylinder heated by gas flames in the interior. This invention is of importance, says the said journal, since it affords a saving of 75 per cent of time and wages compared with the old printing method. It is especially suited for colored show cards, for the coloring of maps and plans, and all sorts of illustrations.

To Brown Iron or Copper.—As it is frequently desired to give iron or copper articles a handsome and yet durable brown coloring, says the *Illustrirte Zeitung fuer Blechindustrie*, for which really good recipes are not at hand, we will give below some directions which have been tried in practice.

The process consists in rubbing the objects with a consistent mass composed of several substances and burning in the applied layer so as to prevent oxidation.

This method finds frequent use on copper ware, not only to avoid oxidation and the tiresome polishing which becomes necessary, but also to impart to the copper, whose natural color is rather glaring, an appearance more pleasing to the eye.

Annealing and careful cleansing with corrosives of the articles have to precede the browning process. A dark brown is obtained by stirring equal parts of verdigris and colcothar (English red) in vinegar to a pasty consistency, applying this on the well cleaned and dried parts, heating to redness, and quickly rinsing off in acetate of copper.

Another mixture which has likewise been found valuable is the following: Make a paste of two parts of finely powdered iron oxide with alcohol. This mass is applied with a brush as uniformly as possible, heat over an open fire, rinse off, and polish with a soft brush.

If the desired effect of the color is not produced thereby, the operation must be repeated.

Lighter brown shades are produced by applying a composition of two parts verdigris, two parts vermilion, five parts sal-ammoniac, and five parts alum with vinegar. After the application the parts are heated and rinsed off.

With the above operations, the greatest cleanliness must be observed, and the touching of portions to be browned with sweaty fingers must be avoided, else spots will result, which can only be removed by taking everything off again.

The process of browning has also found great favor in the manufacture of arms. The barrels of the guns, etc., are, for this purpose, thoroughly polished with emery, cleaned of all adhering grease, and rubbed with the following mixture: Antimony chloride, two parts; crystallized ferric chloride, two parts; gallic acid, one part; water, four parts. This is allowed to dry in a warm place ten to twelve hours; then the

article is warmed slightly, rubbed with a woolen rag, and polished with olive oil and wax. This is repeated according to how the color turns out.

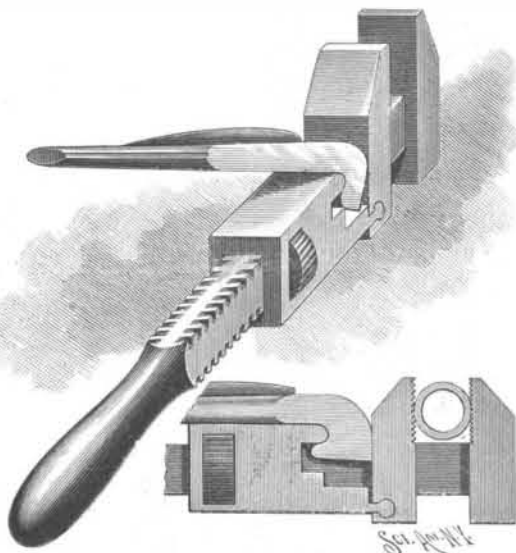
Another good mixture consists of equal parts (by weight) of butter of antimony and olive oil, and one part silver nitrate in 500 parts water, as well as 54 parts blue vitriol, 26 parts alcohol, 14 parts nitric acid, 3 parts iron filings, and 200 parts water.

AN IMPROVED WRENCH.

A wrench has been patented by Charles S. Metcalfe, of Silver City, New Mexico, which provides novel means for obtaining a fine adjustment of the movable jaw in addition to the usual coarse adjustment.

The traveler of this wrench, although operated by the usual nut, nevertheless differs from the travelers of most wrenches in being recessed at its upper end in such a manner that the back portion shall be longer than the front portion. At the end of the long rear portion of the traveler, a cylindrical bearing is provided which is received by a slot in the heel of the movable jaw. By means of this construction, the movable jaw is pivoted on a point remote from the gripping surface, and is carried to and from the fixed jaw by the traveler. A lever is fulcrumed on a semi-cylindrical bearing on the short front portion of the traveler, by means of a hook-shaped head bifurcated to extend at each side of the shank, and provided with a cam-surface at its upper portion and with a connecting straight surface at its upper rear portion. Both cam and straight surface engage the movable jaw.

In using the wrench, the lever is carried out from the shank as shown in the perspective view, the free end of the movable jaw being permitted to drop. When the lever is in this position, the nut is screwed on the shank until the traveler has approached sufficiently near to the fixed jaw to grip the material. By carrying the lever inwardly and parallel with the shank, as

**METCALFE'S IMPROVED WRENCH.**

shown in the side elevation, the cam-surface of the lever will act upon the free end of the movable jaw, forcing the latter parallel with the fixed jaw, and holding the material in a firm, vise-like grip. When the lever is parallel with shank, the straight upper surface of the lever will hold the sliding jaw in adjusted position.

The Nicaraguan Railway.

United States Consul W. B. Sorsby, at San Juan del Norte, in a consular report to the State Department on the subject of the Nicaraguan railway, now for sale, writes:

I have to report that the railway system of Nicaragua, owned and operated by the government, now offered for sale, was completed in 1885-86 and is in two sections of 58 and 32 miles respectively, with about 3½ miles of side and switch tracks and 4 miles of a branch road recently completed, with further extension of the same under way. It is a narrow-gauge railroad. There are three small lake steamers belonging to the system.

According to an inventory taken in 1893, the railway, boats, docks, etc., were worth \$1,798,634 (American gold). I am unable to obtain a copy of the inventory so as to show the property in detail; nor can I give exact data as to the freight tonnage, but I estimate it to be, under present conditions, about 60,000 tons per annum, and capable of such increase as the development and improved conditions of the railway system and of the country will warrant.

It is estimated that to put the railway system in good order an expenditure of about \$100,000 is necessary, to be used in the following manner: Purchase of 100 box cars at \$400, \$40,000; three engines at \$8,000, \$24,000; reconstruction of the Paso Caballos bridge, \$12,000; necessary repairs of the track, \$24,000; total, \$100,000. The gross earnings of the system for nine years, 1886-95, were \$2,017,209, and the expenses for the

same period \$1,438,238, leaving a net earning of \$578,971. The average annual gross earnings for the first three years were \$159,666, and the average annual expenses for the same period were \$94,043. The average annual gross earnings for the following six years were \$256,368, and the average annual expenses for the same time were \$192,686.

It is well, perhaps, to direct especial attention to the fact that the operating expenses have been allowed to entirely absorb the increased earnings.

The net earnings of \$578,971 for the period of nine years indicate a dividend of about 3½ per cent on the valuation of \$1,798,634. If this railway system has been able to earn 3½ per cent under government management, subject as it has been to all the harassing incidents of the military exigencies of the country in the last four years (1894-98), due to constantly recurring revolutionary efforts, and finally to the preparations for war with Costa Rica, it should become a most valuable property in the hands of foreigners and conducted according to the American system of railway management.

The government price for the railway system is understood to be \$2,500,000; and in this connection it may be well to state that the government owes a foreign debt of \$1,400,000, with two years' unpaid interest at 4 per cent; and it is supposed that the desire to pay off this debt is the main object of the government's purpose to sell.

It is believed that the government would award a most valuable concession in order to effect a sale and have the railway system pass under the control of capitalists who would be disposed to improve the present system, and thus aid in the development of the resources of the country. It is thought that, in addition to privileges of the most valuable nature, concessions would be given for the construction of additional railways, either as branches or independent lines, or for an extension of the present system to a point on the Atlantic. For the sum of \$2,500,000 cash and a reasonable guaranty to build a railroad from Lake Nicaragua to some point on the Atlantic ocean ("Monkey Point," for instance, a distance of about 80 miles), in order to afford interoceanic communication and transportation, I believe that a perpetual title to the system, 1,000,000 acres of land, to be selected from any part of the public domain, and practically a monopoly of the railroad construction and traffic of the country, would be given.

From present indications it would seem that Nicaragua is entering upon an epoch of peace and prosperity, and that she is eager for the assistance of foreign capital to aid in the development of the country, lavishly endowed as it is with natural advantages—with a climate agreeable and healthy and free from extremes of heat and cold, with a soil capable of the highest state of cultivation and production, with forests of valuable timber, and with fabulous mineral wealth safely hidden from every effort of exploitation except that of capital.

The greatest need of the country to-day is means of reliable and quick communication between the Atlantic Ocean and Lake Nicaragua, to connect with the present national railway system from the lakes to the Pacific Ocean, in order to insure interoceanic transportation.

The construction of the Nicaragua canal would enhance the value of railway properties, because, while interoceanic travel would be lost, this would be offset by the local traffic resulting from the increased tide of immigration.

The system as it exists to-day, in view of the improvements of the harbor at San Juan del Norte (Greytown) and of the San Juan River, contemplated and even now being vigorously prosecuted by the Caribbean and Pacific Transit Company (the old Atlas Line), will result in an enormous increase in traffic.

The opportunity for investment of American capital is golden, and the influence on commerce between the United States and Nicaragua, with the railway system of the country under the control of Americans, would be well worth careful consideration, not alone as to the gain to the United States, but as to the loss of trade which would inevitably follow if it should be controlled by commercial interests other than our own. These opportunities will not remain open very long; indeed, a strong effort is now being made to secure them by a powerful English corporation.

NEW FRUIT TREE.—A new fruit tree is described by Andrée in the *Revue Horticole*. The name of the plant is *Feijoa sellowiana*; it is indigenous in La Plata, South America, but also thrives in Southern France. The tree which blossomed and bore fruit in Andrée's garden attained a height of 3½ meters and had the form of a shrub. The fruit is an oblong, egg-shaped berry 4 to 6 centimeters long and 3 to 5 centimeters wide, retaining its color even in the ripe condition. The meat of the fruit is firm, of white color and sweet taste, containing much juice and giving off an extremely agreeable and penetrating odor. The flavor is said to remind one of the pineapple.