SCIENTIFIC AMERICAN

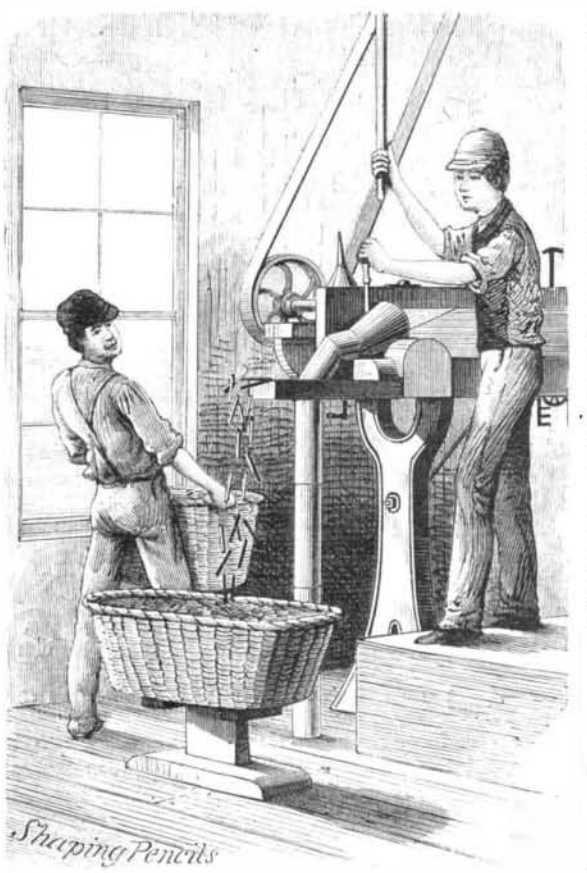
A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XL.—No. 3. [NEW SERIES.] NEW YORK, JANUARY 18, 1879. [$3.20 per Annum. [POSTAGE PREPAID.]

The Adulteration of Soft Soap.

The *Manufacturers' Review* translates from the French of M. Emile Picard the following note on the adulteration of soft soaps:

"One hundred parts of fatty matter, combined with soda or potash, yield 230 to 235 parts of pure soft soap, containing 33·14 per cent of water. When certain adulterants are added in quantities too small to affect the appearance of the soap, 100 parts of grease will yield 320 to 340 parts of what would be a good commercial article, containing 33 to 38 per cent of water. The same quantity of grease can be made to produce 380 parts of soap, containing as much as 52 per cent of water. The adulterants generally used are clay, resin, fecula, and silicate of soda. All are added to increase the yield of soap, and the proportion of water it can contain. Clay is the most harmless of these adulterants. It is partly dissolved by the alkali, but makes the soap opaque, and is easily detected by its insolubility in water. It increases the amount of water required to bring the soap to the proper consistence, but is not otherwise harmful. It is less and less employed every day. Resin combines with alkali, but the resulting compound 'possesses none of the emollient qualities of fats.' It retains large quantities of water, but alters the emollient and detergent power of the soap, and makes it more caustic and corrosive. Soaps adulterated with resin only are clear, brilliant and transparent; more soluble in water than pure soap. They nearly always retain a slight odor of resin which is most noticeable when the soap is warmed. Their color is often redder than usual. They attack the skin, and make linen yellow. Fecula is very harmful, especially when combined with silicate of soda. It is generally employed with three or four times its weight of lye, water, or silicate of soda. Soap made with it contains an excess of alkali, and a very large quantity of water. It is more or less opaque, as the proportion of starch is large or small; it is easily soluble in water; it is much affected by changes of temperature; and its detergent power is much lessened by the large proportion of water it contains. The latter fault is partly concealed by making it excessively alkaline; it is then corrosive, and attacks and destroys the skin, coloring matters, and woolen and silken goods. Analysis reveals the presence of the decomposition products of the latter in the water in which they have been washed. Silicate of soda with fecula is far the most injurious adulterant of soap, and it is also the one most usually employed. Almost all commercial soaps contain it. Silicate of soda in small quantity does not alter the appearance of the soap; but it is decomposed when used, and silica is deposited in the fiber of the flax or cotton, and cannot be removed, rapidly destroying the tissues. Silk and wool are also attacked, and made more liable to be destroyed by alkalies. Water in which silk and wool have been washed with this soap contains considerable quantities of sulphur and ammonia resulting from the decomposition of the material. According to Dr. Vohl, linen and cotton cloths thus treated look, under the microscope, like worn fabrics—the fiber destroyed and the surface covered with a nap. Franklin said good bargains are sometimes ruinous. This is particularly true of soaps. Low-priced samples are never cheap; a larger quantity must be used to cleanse an equal amount, and fabrics are far more rapidly destroyed."



AMERICAN INDUSTRIES.—No. 2.

BY HAMILTON S. WICKS.

THE UTILIZATION OF GRAPHITE.

The works of the Dixon Crucible Co., at Jersey City, are interesting and curious. Established something more than half a century ago, the company has had a long and successful career, never falling behind in the march of improvement, but always prompt to adopt new methods for improving the products of industry and cheapening production.

The late Mr. Joseph Dixon was the originator of the present method of making crucibles from foliated graphite, and the establishment is the oldest and largest in the world of its kind.

Graphite, or what is commonly called plumbago or black lead, has long been known to possess wonderful properties, but the Dixon Company has been mainly instrumental in familiarizing the public with its great value in the mechanic arts. It was also the first to prepare the mineral in salable form for special uses. Resisting all acids and alkalies, and passing almost unhurt through a fire that will melt nickel, graphite is destined to act a prominent part in the industries of the world. It is the softest of all known minerals, a good

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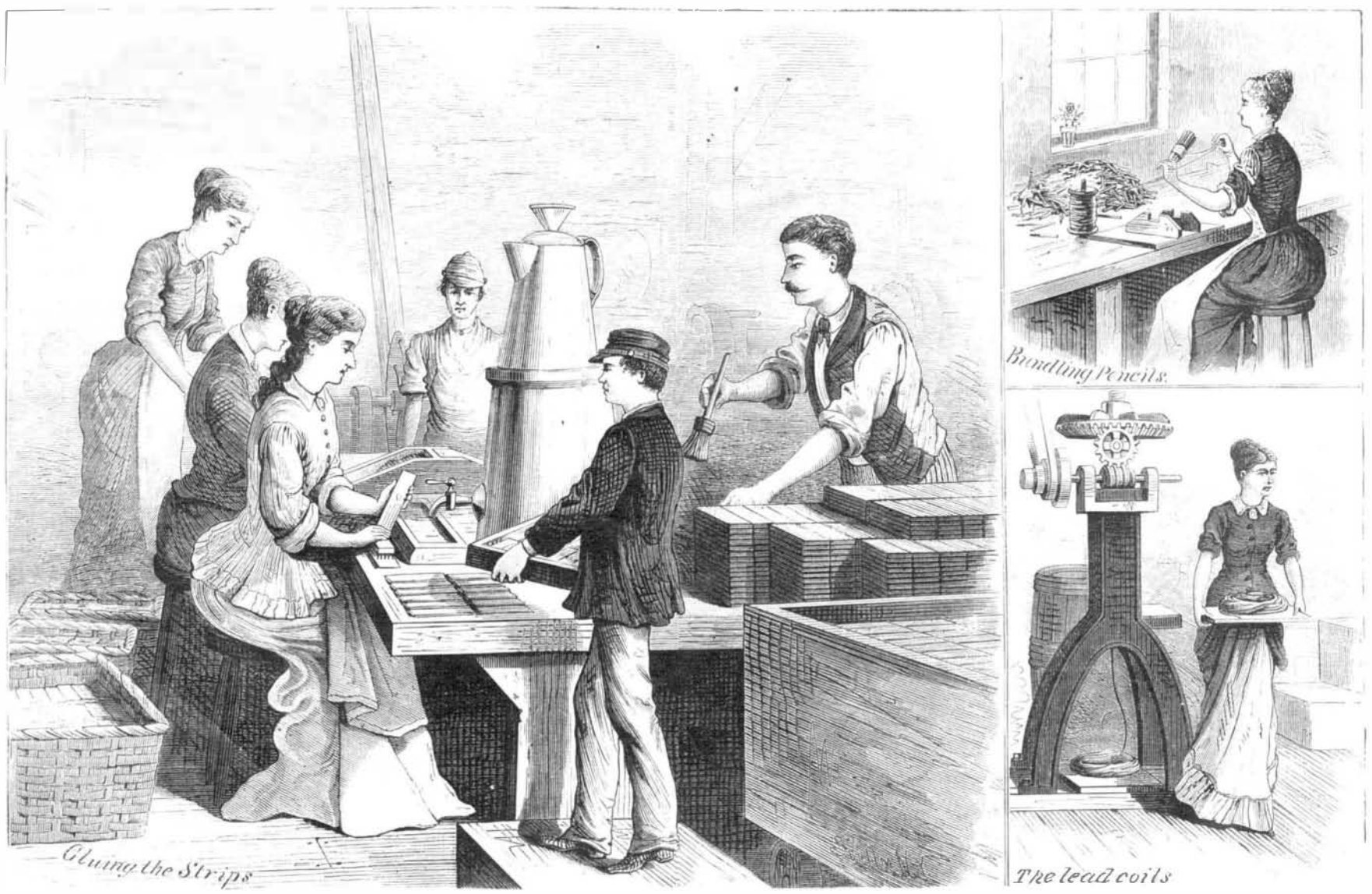

THE MANUFACTURE OF LEAD PENCILS.

A Mammoth Farm.

A correspondent of the Troy *Times*, traveling in Dakota, writes from Fargo, a town, he says, now only eight years old, containing 6,000 inhabitants, describing the cultivated farm of William Dalrymple, containing an undivided estate of 50,000 acres, extending 12 miles along the fertile bottom lands of a most beautiful river, and then back into the interior 11 miles more, the whole covering an area of over 30 square miles.

Of this, 20,000 acres were last year sown in wheat, which has yielded 250,000 bushels as reward for the husbandman's toil. The soil of this Red River farm is peculiarly rich, and adapted to the production of just the cereal cultivated. The upper surface is an alluvial deposit of great fertility, under which is a deposit of marl, containing in large quantities the phosphates and silicates needed in the formation of the berry and the stalk of wheat.

Of course it would be impossible to operate such a farm from one headquarters, so the land is apportioned into subdivisions of 2,000 acres each, every one of which is presided over by a superintendent, who is under the direction and orders of the owner. Each chief overseer has a nice house, in most cases handsomely fitted up, and finished, in several instances, in most excellent taste. Near the superintendent's house is the hands' boarding-house, where all the harvesters board. Back of these buildings are located the granaries and stables, and, a little further removed, the machine shops, engine rooms, and windmills. All the buildings follow a plain but quite attractive style of architecture, and answer every purpose intended. Each subdivision has the same set of buildings, and is operated in quite the same way.

To run the farm it requires the services of 450 men and over 300 horses and mules; to keep the accounts, 3 bookkeepers and 2 cashiers are kept constantly busy. Water is pumped by windmills several miles back into the interior from the river. 75 Wood's reapers and binders are used in the harvest, and pile up yellow sheaves at the rate of 1,000 acres per day. During the entire harvest season last year they were retarded only one half day by inclement weather. The grain is separated from the straw by 18 steam thrashers, which puts it in the bins at the rate of 1,000 bushels per day.

STRAUB'S SCIENTIFIC GRAIN MILL.

We give herewith engravings representing in different views a mill for grinding grain, middlings, minerals, and

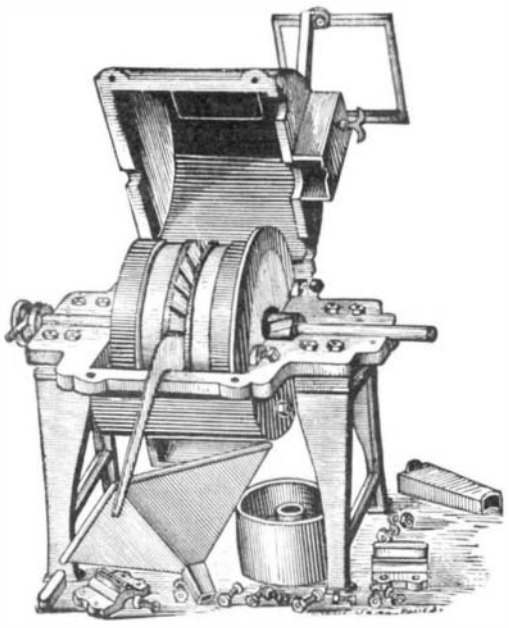

Fig. 2.—STRAUB'S MILL OPEN.

paint, which is known as Straub's Scientific Grain Mill. It is claimed by the manufacturers of this mill that burr stones revolving in a vertical plane are more effective than horizontal stones of double the diameter, running very light and steady and grinding faster and cooler than ordinary stones. The principal requirements in a mill of this character are to have the parts accurately fitted and rigidly held in position; to have a ready means of taking up wear, and to have it so simple that it can be readily understood and managed by any one likely to require such a mill. The manufacturers of the scientific grain mill claim to have met these requirements. Fig. 1 is a perspective view of the mill, giving a good idea of its external appearance. Fig. 2 shows the mill opened, with the bar between the stones which is employed to lift them from the casing and place them in position for dressing, as shown in Fig. 3.

This mill has a silent feed and is adapted for grinding wheat flour; regrinding middlings; grinding corn, oats, and feed; and it may be used for grinding minerals, gold quartz, rock, slate rock, fire brick, dyewood, bone, cochineal, foundry facing, and whatever can be ground by French burr stones. It is especially adapted to farm and plantation use, as the smaller size may be driven by hand or horse power.

Further particulars may be obtained by addressing the manufacturers, Messrs. A. W. Straub & Co., 2231 Wood street, Philadelphia, Pa.

[*Continued from first page.*)

conductor of heat and electricity, the purest carbon known next to the diamond, and is capable, the manufacturers claim, of being divided finer than any other known substance. Its proper color is that of a darker shade of fractured steel. Its best known use is for pencils, and the next is, perhaps, for crucibles and refractory mixtures, and then as a conducting coating for galvano-plastics. Its unchangeable character

THE RAILROAD, WITH BUNDLES OF PENCILS.

and smoothness have attracted much attention to it as a lubricator. The use of graphite for lubricating is not new. It was used for that purpose more than 200 years ago; but the want of a pure article prevented its adoption to a large extent. Within the past few years the Dixon Company have taken the matter up in earnest, and have succeeded in producing graphite of purity and free from grit, at a price that must bring it very largely into use for lubricating. Its well known properties have caused many persons to mix it with oil or grease or apply it dry to journals, and their disappointment has caused them to condemn the article, the graphite being of inferior quality. The brand of graphite prepared by the Dixon Company, known as the "Perfect Lubricator," has cured, it is stated, the step of a mill of heating when every other tried means had failed.

A grease is now being prepared by the company, for use in mills and for railroads, steamboats, cylinders, gearing, bearings, slideways, etc. The company has named the article "Dixon's Everlasting Graphite Grease." For this grade of graphite the company was awarded the gold medal at the Paris Exhibition of 1878.

The most interesting mechanical processes in the Dixon Works are to be found in the Pencil Department, which is illustrated on our first page, the large engraving showing the several operations of making the leads, gluing the pencil strips, and bundling the pencils. The smaller cut shows the machine for shaping the pencils. The graphite is divided as finely as mechanical means will permit, and is then floated through several tubs or vats, placed one above the other; the coarsest of the particles will settle in the first vat, the next coarsest in the next vat, and so on till the finest have lodged in the last, or lower vat.

A very smooth, blue clay is dissolved in the upper vat, and floated in the same manner, the finest being gathered into the lowest vat. The finest clay and the finest graphite are mixed together for the finest pencils. The proportion of clay determines the grade of hardness of the pencil when finished, the more clay the harder the "lead." After the materials are mixed together the plastic mass is placed in a "well." A screw press follower presses the material out through a hole in the bottom of the well, when it coils up like a thread under the machine, so that it may be handled like a skein of yarn.

It is then straightened out in lengths, dried, placed in a crucible, and submitted to a high heat and baked like earthenware for some hours. The "leads" are then strong enough to be handled like knitting needles. The cedar boards are sawed into suitable lengths and of a width for six pencils. They are run through a machine that planes and grooves them on one side, nimble fingers place the leads, the two halves or boards are glued together, and they are ready for the shaping machine. The little blocks enter at one side of the machine, and the pencils fall into a basket at the other side at the rate of 216 per minute. An ingenious contrivance counts them. On leaving the shaping machine the pencils are about as perfect as woodwork can be made. They pass thence into the finishing room, where they are varnished and finished in any desired color, stamped with the title and grade and packed in boxes for sale. Eighty-six thousand pencils per day are now passing through the works, made throughout by machinery, and claimed to be more perfect than is possible by hand labor.

The Dixon Company not only produced its own machinery for the manufacture of the pencils, but maintained the idea of originality by adopting a system of stamps for the different grades. The whole system of pencil manufacture is, in the Dixon Company's works, original and interesting. The machines are mainly automatic, but very simple. The finest grades of pencils for artists and draughtsmen are manufactured by this firm. The company are the only pencil manufacturers, we believe, that were awarded a gold medal at the Paris Exhibition.

A Canadian Gold Mine.

Dr. Laflamme, of the University of Laval, Quebec, favors us with a photograph, natural size, of a nugget of pure gold,

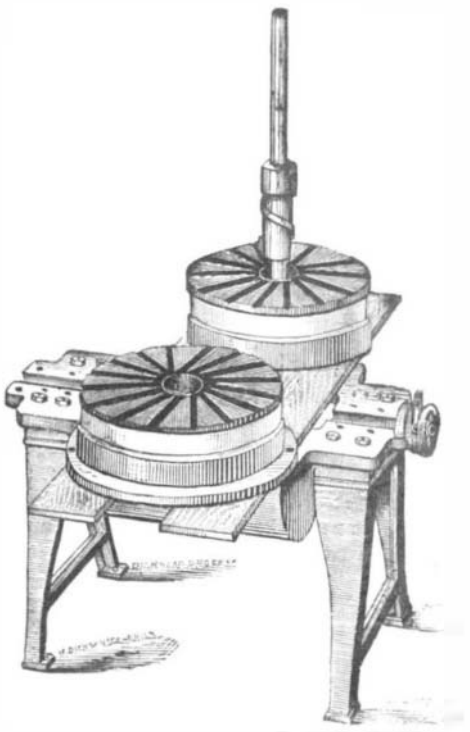

Fig. 3.—STONES IN POSITION FOR DRESSING.

weighing 38 ounces, lately found in the gold mine worked by Messrs. L. Saintrouge & Co., in Beauce County, near Quebec. The mines are said to be very rich, two weeks' work having furnished 150 ounces of gold; number of men employed not stated. The means employed, however, are described as of the most primitive character. The gold is found in bowlder clay underlying glacial drift, also in quartz accompanying the clay, but not in large quantities.

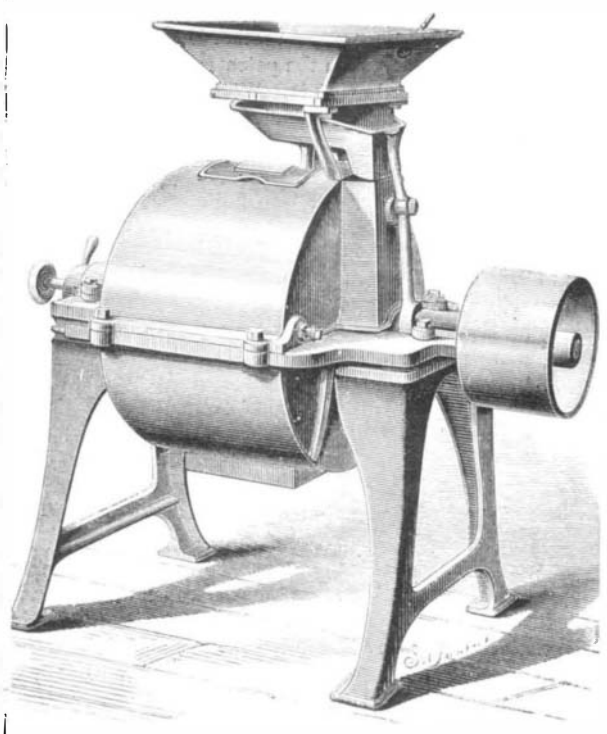

Fig. 1.—STRAUB'S SCIENTIFIC GRAIN MILL.

Recent Engineering Inventions.

An improvement in Methods of Connecting Sputs to Boilers has been patented by Mr. John Trageser, of New York city. This invention consists in a sput formed with an annular recess or cavity around its body, into which recess the edge of the opening in the boiler is calked and the joint afterward brazed

Mr. George Elliott, of New York city, (P. O. Box 2336), has patented an improved Paddle Wheel, the paddles of which are so constructed as to diminish the velocity of the middle portion of the current of water set in motion by the paddles, in order that the remaining portion of the said water may be made efficient, and the combined action of the different parts of the paddles upon the water may be more effective for the propulsion of the boat. The paddles are made in the form of rectangular parallelograms, and have elliptical apertures through the middle.