

space, below the furnaces. It was the opinion of the engineer of the *Mooltan* that the grease caused the boilers to prime. These surface condensers are known by the name of Hall's, and were first tried about thirty years ago, but prejudice operated against their introduction. The exhaust steam passes through the interior of the tubes, and the cold water is applied outside. This is the reverse mode of operating to that of several condensers most recently introduced. The condensers of the *Mooltan* have been very successful, but it is believed that the better plan is to pass the condensing water inside of the tubes.

CALIFORNIA ITEMS.

MINERAL PAINTS.—The following extracts are from the *Contra Costa Gazette*:—Native paints are found about two miles from the town of Martinez, on the banks of El Hambre Creek at the foot of a high hill. They lie in ledges extending into the earth under the hill, the out-croppings of which alone are visible on the surface of the ground near the aforesaid creek. These ledges vary from ten to twenty feet in width, and are of unknown length and indefinite depth, perhaps miles in extent. At least four of the principal or primary colors have been found contained in the earths dug out of these ledges—viz: red, yellow, green and blue. Here are some of the varieties:—

1. Terra Sienna, a ferruginous ocher, a native of Sienna in Sicily, whence its name; an article indispensable with all painters and never heretofore found in America.

2. Lazulite, a light bluish mineral, the base of all the ultra-marines and indispensable to the manufacture of paints.

3. French yellow, a very pure article, commonly found in France, whence it is imported for use in the arts.

4. Sienite, the primary color for all manufacture of fine green paints, found in abundance here like that generally imported from Prussia.

5. Venetian red, a very fine article, superior to that which is imported from Venice for use in our country.

RESIN AND TURPENTINE.—The *California Farmer* says:—

"At the Agricultural Fair at Placerville, this year, we had the satisfaction of meeting a Mr. Jacques, who had become acquainted with the existence of fir-balsam trees in large quantities, and had engaged in tapping them, gathering the balsam in a crude state, and from it manufactured resin and turpentine. The product from these trees is a pure and transparent liquid balsam, yielding a turpentine almost as smooth as Holland gin, and a pure light colored resin, remarkably fine. During the last week the first lot of resin, about twenty barrels, very superior, arrived in this city from Placerville, consigned to Messrs. Moses Ellis & Co."

COPPER.—The *Stockton Independent*, of December 2nd, says in relation to the progress of Copperopolis:—"The Union Company at Copperopolis is now working with three engines, running night and day. The Keystone, Empire and Calaveras claims are giving out better prospects of late; and the Webster, a new claim under the management of Captain Sanders, is coming rapidly into importance. Schools, Sunday schools and religious societies are taking root at Copperopolis, and altogether the town is acquiring a degree of permanence and character hardly to be expected of a place whose foundations were laid but two years ago."

WINE.—At a late wine-growers' convention, held in San Francisco, it was stated that 70,000 gallons of native wine had been exported in 1862.

The third division of the Southern Railway of Chili was lately opened to San Fernando, the Capitol of the province of Colchagua, distant from Santiago 86 miles. This railroad is stated to be well constructed, it having numerous bridges constructed in a solid and creditable manner.

The Manchester (England) *Examiner and Times* mentions as the "most gratifying news" received by the last mail from America, "the movement which has been taken up so warmly to send aid to the Lancashire operatives."

MISCELLANEOUS SUMMARY.

THALLIUM.—On this new metal the Paris Academy of Sciences has received a second communication from M. Lamy, from which it appears that if the discoverer, Mr. Crookes, at first discovered it to be a non-metallic substance, he was not far wrong. At least, M. Lamy finds it wanting in one of the chief properties of metals—viz., the power of conducting electricity and heat, since the power of induction developed in the metal are of but slight intensity when the circuit of the pole is successively closed and broken. If heated in concentrated alcohol a part of it is dissolved, and a curious compound is produced, called by M. Lamy "thallic alcohol." It is a limpid oil, containing great refractive power and a caustic taste.

DUMMY engines are to be placed on the new railroad between Jersey City and Bergen Point. In shape, they are similar to the common horse-car, but much larger. In front is the engine-room, divided from the passenger apartment by a partition. The latter apartment is 22 feet long by 9 wide, and will seat 30 persons. The engine is of 15 horse-power, and consumes its own smoke. Such engines have also been recommended for that part of the railroad running through Brooklyn, thence to East New York and Jamaica.

A BIG PEAR.—There is now on exhibition at the office of the *American Agriculturist*, in this city, a mammoth pear, grown in the orchard of E. L. Beard, at San Jose, Cal. This pear weighs three pounds and seven ounces. The same tree produced a pear, a few years ago, that weighed three pounds and six ounces.

In recent gunnery experiments in Verona, Fort Wratislaw, belonging to Austria, was cannonaded first at a distance of six hundred paces, and then at one thousand, the guns being charged with gun-cotton. The impulsive force of this substance was found to be $2\frac{1}{2}$ times more than that of ordinary gun-powder.

PROFESSOR WHITNEY, the State geologist of California, found among the Sierra Nevada, about 2,000 feet above the level of the ocean, an almost perfect jaw of a rhinoceros. Huge petrified oyster shells were also found among the mountains of the interior and at a great elevation.

The native copper of Lake Superior is dense, ductile and fibrous, as if it had been violently compressed when cold. It is very strong, but when melted it takes the same structure as all manufactured copper.

SPIRITUAL "SHINPLASTERS."—In Saugerties, N. Y., an enterprising tavern-keeper has just issued a series of spiritual "shinplasters"—nothing less than pint bottles filled with whisky, and it is said they pass current among all his customers.

The result of a general test trial of a London fire brigade showed that the average time taken for turning out, equipping, lighting lamps, and starting with the fire-escape, was one minute eleven seconds.

NEW MODE OF CLARIFYING COFFEE.—It is said that eggs are now so dear in Trenton, N. J., that the housewives use the white of their eyes instead of the "white of the egg" to clear their coffee.

WINTER WHEAT.—In many parts of the West the winter wheat is represented as being considerably injured by an insect, in consequence of the open season.

THE TOMB OF WASHINGTON'S MOTHER.—Just beyond the city limits of Fredericksburg, Va., an unfinished monument, begun in 1833, marks the tomb of the mother of Washington, who died in 1789.

The number of sea-going vessels in the world is about sixty-five thousand, two-thirds of which belong to England and the United States.

PUNCH'S PHILOSOPHY OF TIGHT LACING.—*Punch* says women first resorted to tight lacing to prove to men how well they could bear squeezing.

BLIND DEITIES.—Love, Justice and Fortune are said to have no eyes; but all three deities make us mortals open our eyes pretty wide sometimes.

The whole number of locomotives employed in England, Scotland, and Ireland is 6,156.

VALUABLE WORK FOR INVENTORS, PATENTEES AND MANUFACTURERS.

The publishers of the *SCIENTIFIC AMERICAN* have just prepared, with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade Marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Reissues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the Granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions. It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the Patent Law and Practice, but also to answer a great variety of questions which have been put to them from time to time during their practice of upwards of seventeen years, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of 6 cents in postage stamps. Address **MUNN & CO.**, Publishers of the *SCIENTIFIC AMERICAN*, No. 37 Park Row, New York.

The Inventor of the Fire-escape—Abraham Wivell.

Wivell now took to scheme-dreaming, some of his friends said. He proposed a plan for draining London independently of the Thames; for, said he, if all the sewers drain into the Thames, the Thames itself must become one great sewer. But this scheme fell to the ground; it was too far in advance of the times. His fire-escape was more successful; but, poor fellow, how sedulously he worked at his idea, and what time and money he spent before the design of his brain was embodied in tangible wood and iron! His first escape consisted of a rope, fastened in the inside wall of the upper story of the house, and a belt, which was to be girded around the body of the person escaping, and was also to be attached to the rope. With such an apparatus Wivell frequently descended from the topmost room of his house, to the wonder of the surrounding neighborhood. Although he had demonstrated the practicability of this plan of escape, people were slow to adopt it, and further thought led him to the production of the well-known fire-escape, now happily found at the convergence of most of our principal London thoroughfares. Even after he had completed this escape, he could not, for a long time, get any help in bringing it out. But he was enthusiastic and persevering; and he at length succeeded in calling a public meeting, when he explained his plan in detail. The formation of a committee was the result of the meeting, and Wivell was awarded with the expenses of his escape, and a gratuity of £10! Ultimately the "Royal Society for the Protection of Life from Fire" was formed, and Wivell's invention was adopted.—*Social Science Review*.

Spectral Analysis.

A practical application is likely to be made of the beautiful results of spectral analysis in the casting of steel. It is important to know the exact moment at which to shut down the cover of the furnace during the melting of metal; time must be allowed for the escape of the gaseous products which are injurious to the steel, but if that time be prolonged, an injurious effect of another kind is produced. To meet this contingency, it has been proposed to test the gases as they fly off by means of the spectroscopy; and as soon as the particular color is observed, peculiar to the gas which begins to escape at the moment the molten metal is in proper condition, the manufacturer will then have an infallible sign of the proper moment for closing the furnace.

COLLODION and castor-oil mixed together with resin and the carbonate of lime, make a cement of which medallions, knife handles and combs may be manufactured.