

traffic, and the consequence has been that the covered ways are too low to allow the smoke and steam to rise, and in some places the heat is stifling. In the last covered way on the Italian side of the summit, we were in a vapor bath. But this discomfort will have been completely avoided in a few days, as it already has been in some parts of the covered ways. Openings are being cut along the roofs, and no more inconvenience will then be felt than if the line were uncovered—far less than is habitually experienced in the long tunnels between Turin and Genoa, and Bologna and Florence. Before winter shall return means will have been employed to complete these covered ways in a manner that shall exclude the snow, and yet allow the smoke and vapor to rise. It is also intended to try various kinds of fuel, and if possible to adopt that which gives out the least smoke.

The time hitherto employed (in the various trial trips recently made) in getting across the mountain, has been a little over four hours of actual locomotion. But stoppages are inevitable, chiefly for the purpose of watering the engine, and the journey will hardly take less than five and a half hours, at least, under present arrangements, which would be equal to about ten miles per hour. The diligences, in ascending the mountains, make about ten miles in three hours.

### Editorial Summary.

**ICE MACHINERY**—A correspondent writes us from New Orleans that a company in that city is now engaged in making blocks of ice of any convenient size. The two machines, made after the plan of Carrie, of Paris, are now in operation, and produce twenty-four tons per day. Two other machines are nearly completed. By a certain evaporating process, of which ammonia is the chemical ingredient, and heat the active agent, the filtered water of the Mississippi is converted into cakes of ice eight or ten inches wide and two feet long by two inches thick, at a cost less than that of transportation from the North—less than \$5 per ton. What will be the result of this new industry, time alone can determine. If it be what it seems, ice may be made cheaper, as it is wanted, in our Northern cities, that it can be cut in the winter and preserved for summer use.

**TROPICAL TELEGRAPH LINES**—The putting up of telegraph lines in the jungles and forests of the tropics is a work of the utmost difficulty, and the peculiar conditions of the region require special methods of construction. In India the wires are really small bars of iron  $\frac{1}{8}$  of an inch in thickness, an amount of rigidity being thus obtained, which is necessary to meet the requirements of the country. The difficulty, which in this country, is experienced in keeping the wires insulated during heavy rains, fogs, or thunder storms, is immensely augmented in the regions where these meteorological phenomena abound, and the use of this large size of wire is rendered necessary to retain enough electricity to work the wires.

**PARISIAN ELECTRICAL JEWELS**—M. Trouvé has made several new and ingenious applications of electro-magnetism in ornamental trinkets, so that now it is quite common to see at fashionable balls in Paris a diminutive butterfly or humming bird perched upon a lady's head, and fluttering its wings as naturally as possible. The owners of these toys carry concealed in their chignons a small battery and minute Ruhmkorff coil, the former composed of zinc excited by a solution of sulphate of mercury, the whole inclosed in vulcanite cells, so that the existing solution cannot escape to the damage of the owner.

**A REMARKABLE MIRAGE** was lately witnessed at Dover, England, whereby the dome of the Cathedral at Boulogne, France, was made distinctly visible to the naked eye, and by means of a telescope, the entrance to the port, its lighthouse, shipping, the hills surrounding the town, and neighboring farm houses, with their windows illuminated with the setting sun, were plainly distinguished. Even a locomotive and train were seen leaving the city and traveling toward Calais. The distance from Dover to Boulogne is about thirty miles.

**ARCHAEOLOGICAL RESEARCHES IN THE WEST**—The vestiges of the works of the ancient "mound builders" of the West, are being made a study by the eminent archaeologist, Dr. W. De Hass. He has made a general survey of the field, locating the ancient works, mapping and measuring them, collecting information and vestiges of art, and excavating many of the smaller tumuli. When finished, an account of his explorations will be published in a superbly illustrated volume.

**CRAB CULTURE**—A gentleman at Annapolis, Md., has fenced in a cove on the Severn river, for the purpose of raising crabs for market. He has now about 4,000 of these crustaceans in advance, and feeds them on coarse fish and any kind of refuse meat. A daily inspection is made of the stock, that those who have shed their shells may be dispatched to market in this state, when their value is twenty per cent higher than when possessed of their ordinary covering.

**A FRESH and very complete specimen of ancient mosaic art** has just been unearthed in Rome, being the pavement of a room excavated in the Vicolo Sterrato. Other rooms belonging to the same house will be revealed by excavating in the adjoining garden, belonging to the nuns of Santa Susanna. The peculiar interest attached to this discovery is the almost assured fact that the building containing this mosaic formed part of Sallust's villa.

**A CORRESPONDENT** in South Carolina writes that the peach trees give promise of affording the most abundant crop ever

known. As the internal revenue tax is too enormous to allow the profitable manufacture of peach brandy, the only way to save them is by canning and shipping north, and such will be the supply that our informant apprehends prices will be lower in the New York market next fall and winter than ever before.

### MANUFACTURING, MINING, AND RAILROAD ITEMS.

The bill passed a few days ago by the Massachusetts House of Representatives, authorizes the Governor to make a contract for finishing the Hoosac tunnel within seven years, at an expense of not more than \$5,000,000. It also provides for the payment of \$250,000 for the completion of the Troy and Greenfield railroad, and \$350,000 for interest.

The vast coal mining operations in the famous "Black Country," of England, are beginning to produce effects long since apprehended by mining engineers. The local papers state that recently, at Cinder Hill, the ground began to subside, and continued caving in for several hours, resulting in a pit 172 feet wide and about sixty feet deep. Trees, hedges, and a great quantity of brick clay were swallowed up, but no loss of life is reported.

In the manufacture of trimmings, made to a great extent of silk waste, there are employed in Paris alone 8,500 persons, producing annually products to the value of \$8,000,000, and throughout the empire this industry occupies more than 30,000 hands whose aggregate production is valued at \$20,000,000.

The leading directors of the Hudson river and Central railroads, lately passed over the line between New York and Buffalo, on a tour of inspection. With a single engine, the train traveled over the former road at the speed of sixty miles in seventy minutes. On their return, the distance of thirty-six miles, from Rochester to Lyons, was run in the space of forty minutes.

The people of Montana are devoting some attention to coal mining, an extensive deposit having been opened near Virginia City. The supply appears to be practically inexhaustible, and though of inferior quality, there is little doubt but that it will improve as a greater depth is attained, as is usually the case in coal formations.

An enterprising English company, after overcoming almost insurmountable difficulties, have established two extensive iron works at Zimapan, in Mexico. In these works steady employment is given to between 500 and 600 native laborers, and over 600 tons of iron are annually manufactured into bars or other varieties of merchantable iron, and sent to the city of Mexico over a difficult mountain road, built and kept in condition by this same company, at their own expense, the government never contributing in labor or money to its construction.

A portion of the Philadelphia, Wilmington, and Baltimore railroad is now being relaid with steel rails, made at Lancaster, Pa., from metal made by mixing the ores of that locality with magnetic iron ore from New York. The metal is said to wear very slowly, is not liable to mash, and is of great strength.

The average cost per mile of the railways of Pennsylvania, is \$45,186 91; of Illinois, \$37,583 13; of Nebraska, \$19,334 88; of Missouri, \$30,167 73; of Texas \$62,002 15. The first cost of constructing English railways is immense, when compared with these prices, but when once built the British road requires far less working expenditure. To keep the line in repair in England costs less than eleven cents per mile annually; for French roads, eight cents, and for American roads at least twenty-five cents per mile.

Mr. Philips, in his communication to the Royal Society of London, describes the growth of mineral veins in a locality about seven miles distant from the Comstock silver mines, Nevada. The region abounds in boiling springs, and from them sulphur, silica, and an anhydrous oxide of iron are deposited, the two last forming semi-crystalline beds. One assure exhibits a silico-metallic deposit. Mr. Philips concludes that quartz veins have generally been produced by slow depositions from aqueous solutions of silica. That gold may be deposited from the same solutions he attempts to prove from the presence of that metal in pyrites enclosed in siliceous incrustations, and from the fact that large quantities of the precious metal have been found in the interior of the stems of trees, which, in deep diggings, are often converted into iron pyrites. Sulphide of iron may in some way be connected with the solvent by which metallic gold is held in solution.

At Munich, Germany, is a governmental iron foundry, or industrial school, where the best iron workers in Germany have received their education. But this establishment, whose products have obtained a world-wide celebrity, is about being broken up, the people's parliament having requested its discontinuance, because carried on with an annual loss of \$700. During its existence, besides several thousand small figures, busts, and ornaments, the foundry has turned out one hundred and forty nine colossal statues, six equestrian statues, eight ornamental gates, an obelisk one hundred feet high, and the statue of Bavaria, sixty feet in height; and at the present time a number of large works for this and other countries are under way, including a fountain with sixteen figures for the city of Cincinnati, another with five figures for Central Park, New York, a statue for St. Louis, and six life-size figures for the Washington monument, Richmond, Va.

The contest in the Connecticut Legislature, which was waged for several years past, between the friends and opponents of a railroad bridge across the principal river of the State, has been decided in favor of the former interest. To the Shore Line railroad company is granted the desired permission to construct a draw bridge over the Connecticut, at its mouth, and to the projected Air Line road between this city and Boston, another bridge over the same stream, at Middletown.

The cities of Lowell and Fall River are having a friendly dispute concerning the right, claimed by each, to the title of the "Spindle City." Lowell boasts of 483,864 spindles, 12,518 looms; Fall River of 507,900 spindles, 11,500 looms; the first giving employment to 13,729, the last to 6,750 hands. It is not really the simple number of spindles that gives the glory, for one mill may turn out more goods than another with a larger number of spindles. The Lowell mills, last year, used 16,770 tons of cotton while those of her rival manufactured 11,637 tons. Additional to this, each city has peculiar products, whose values are not comparable, so that no final decision of the case can be fairly made.

Mr. J. F. Bennett announces that he can remove sulphur and phosphorus from pig iron, during its treatment in the Bessemer process, by introducing into the converting vessel carbonic acid gas, either before or with the air blast. He asserts that sulphurous and phosphoric acid are formed at the expense of the carbonic acid gas, the carbon of which is liberated. The gas is produced by acting on brimstone by hydrochloric acid, or by burning carbonaceous matter and storing in a gasometer.

A magnetic mountain has been discovered in Swedish Lapland. It is traversed by a vein of magnetic iron, several feet in thickness. The owner hopes to supply all the world with loadstones. One weighing sixty-eight Swedish pounds has come into the possession of Prof. Dore, of Berlin.

An agricultural exchange presents the claims of the railroad to the farming community by showing that, on a common road, wheat would consume its own value if carried three hundred and fifty miles. In other words, it would be worthless at that distance from market, while by rail it can be carried three thousand miles at a profit. Railways, then, multiply by ten the distance from any grain market at which its wheat may be raised, and the same remarks apply with evident variations to other products.

New interest is awakened in the proposal to bridge the English Channel, from the fact that a design by M. Bouet, a French engineer, has received the favorable commendation of his Emperor, who has ordered him to elaborate all details of the plan, compute the cost, ascertain the time necessary for its construction, and probable profits of the enterprise. The bridge is composed of a series of ten lengths, each with a span of two miles.

In Mr. Hewitt's report on the European Rolling Mills, it is stated that reversing mills are generally employed in Great Britain in preference to three-high rolls. In France, three-high trains have been in use for rolling girders since the year 1849, and everywhere upon the Continent the principle seems to be perfectly well understood, but the reversing mill is generally preferred.

On a line of railroad owned by the Lehigh coal and navigation company, is a plane at the north slope of the Wilkesbarre mountain, with an inclination of 14 feet, 8 inches per 100 feet. For dragging the loaded cars up the slope, a wire rope, said to be the largest, heaviest, and longest ever made, has just been completed at an establishment in Trenton, N. J. The load drawn up at each trip is eighty-five tons; length of rope, 3,700 feet; diameter, over two and one half inches, and weight twenty tons.

How best to furnish communication between passengers and guards, is a problem as yet unsolved in the British mind. The latest plan for accomplishing the desired aim, is providing each train with a long metallic tube, closed at its hinder end, and connected at its other end with an air pump, placed under the tender of the engine. The piston of the pump is connected with the driving wheels, so as to work slowly as long as the train is in motion. As long as any air is in the tube it is exhausted by the pump, and forced out through a whistle near the engineer. The tube has a tap in every compartment to be opened in case of necessity, when air is admitted, the whistle, as a consequence, sounds, and as the passenger cannot close the orifice, will continue so doing until the train is stopped.

### Recent American and Foreign Patents.

*Under this heading we shall publish weekly notes of some of the more recent and foreign patents.*

**ANTI-GRANULATING LARD COOLER**.—Geo. C. Cassard, Baltimore, Md.—The object of this invention is to enable lard to be rapidly cooled in large quantities, by machinery, in such a manner that it shall not granulate, and thereby become injured in quality.

**GAS STOVE**.—J. D. Spang, Dayton, Ohio.—The object of this invention is to construct a neat and convenient portable self gas generating stove, which can be easily kept in order, and regulated, which is adapted to all the various purposes of cooking, heating, etc., and which utilizes the heat and the fuel to the greatest possible degree.

**INK WELL FOR SCHOOL DESKS**.—C. T. Chase, Albany, N. Y.—This invention consists of an improved ink well, the arrangement of which is such, that but a small opening is left for the ordinary purpose of dipping, over which a cap fits when not in use; but, also, so constructed that the whole cover is readily moved aside, when desired, for the purposes of filling or cleansing the well.

**ARTIFICIAL FUEL**.—E. Louiseau and C. F. Reguin, Nashville, Tenn.—This invention relates to a new compound of which coal dust forms a material ingredient. The object of the invention is to utilize coal dust, by mixing it with cheap substances, so as to enable the poor to acquire a good, inexpensive and convenient fuel.

**LAMP BURNER**.—J. W. Schreiber, New York city.—This invention relates to a new lamp burner, which is not dangerous and by which a large, bright flame is produced.

**MUSIC TYPE**.—Edward L. Balch, Boston, Mass.—This invention relates to a type for printing music charts for use in schools, seminaries, etc., the object being to print such charts with legible type, as with movable metallic types, and as the distance at which the charts are required to be seen and read is great, thick and heavy lines for the music staff, as well as the stems of the notes, are required.

**CULTIVATOR**.—Samuel Reed, Rising Sun, Md.—This invention has for its object to improve the construction of cultivators, so as to make them more convenient and effective in operation.

**WARPING CHUCK**.—Joseph T. Haskins, Rockport, Mass.—This invention has for its object to improve the construction of the common warping chuck, so as to prevent the wearing or chafing of the warp or lines in warping a vessel, or when she is fastened to the wharf.

**CROSS BAR LOCK**.—James E. Haeger, Staunton, Va.—This invention has for its object to furnish an improved cross bar lock, simple in construction, easily operated, and effective in operation.

**MACHINE FOR MAKING BEER CASK BUNGS**.—W. Donaldson, Cincinnati, Ohio.—This invention has for its object to furnish an improved machine by means of which beer cask bungs may be formed rapidly and accurately.

**SUBTERRANEAN WALLS**.—Max Thode, Mattoon, Ill.—This invention consists in forming the walls of cisterns, cellars, or other subterranean structures, in two parts, or double, with an interlining of pitch, asphaltum, or other equivalent resinous substance, by which means water or dampness is excluded.

**AUGER**.—N. C. Santord, Meriden, Conn.—This invention consists in forming an auger with two or more cutting lips communicating from the first or usual cutting lip and passing around the last turn or twist of the helical part of the auger, each successive lip being at a quarter distance from the axial center of the auger than the preceding, and in a different horizontal plane, whereby the paths of the several lips are different and distinct, and the auger may be operated more easily.

**CIRCULAR FILE AND SAW SET**.—Benj. P. Pendexter, Minor, Me.—This invention relates to a new and improved method of constructing machinery for the filing of saws and plain surfaces and for setting of saws, whereby the same is done more accurately and more rapidly. It consists of a circular file attached to a flange wheel on a rotary arbor, and of an adjustable table attached to the frame on which the saw or other article to be filed is placed, so that the same may be set at any angle to the rotary saw. It consists also of an automatic saw set attached to the frame of the machine and in combination therewith, operated by a cam in said arbor against the face of a spring or its equivalent, whereby the saw may be set without the operator leaving the machine.

**HAT AND WEB FELTING MACHINES**.—Chas. Mossant, Bourg du Péage, France.—His invention refers to a new method of constructing a felting machine, which is applicable to and particularly designed for the felting of hat forms or cones, but which can be effectively applied to the felting of wool in one continuous web or band, or similar articles.

**ASH SIFTER**.—Charles Folsom, New York city.—This invention relates to a new and useful device by which ashes or other substances may be both transferred to the sifting apparatus, and sifted without the escape of dust.

**WAGON OR SLED BOLSTER**.—George Richards, Richland Center, Wis.—This invention relates to improvements in bolsters for wagons, sleds, etc., the object of which is to provide a connection for the stakes, whereby they may be turned down out of the way when the wagon or sled is to be loaded with any heavy article requiring to be passed over the side of the same.

**MACHINE FOR MAKING CIGARS AND CIGARETTES**.—Joseph and Alexander Marengo, Burlington, Vt.—This invention relates to a new and useful machine for the manufacture of cigars and cigarettes, whereby much valuable time is saved and a quality or kind of tobacco may be used which by other methods cannot be worked into cigars.

**LATHE MACHINE FOR FITTING WRISTPINS IN CRANKS**.—Geo. Raft, Erie, Pa.—The object of this invention is to accomplish the fitting of wrist pins in cranks or crank disks, whereby the axis of the wrist pin shall be exactly parallel with the axis of the crank shaft, a condition always requisite to obtain a smoothly working crank shaft. It consists of a boring attachment which is borne by the lathe carriage, to bore out the eye for the wrist pin while the crank shaft is still on the centers of the lathe.

**CAR WHEELS**.—W. R. Thomas, Catawauqua, Pa.—This invention relates to improvements in car wheels made of cast metal, whereby it is designed to provide a more durable wheel, and one which is less liable to be affected by unequal contraction or expansion than any now in use, and it consists in an improved form of wheel, where the metal is disposed in a manner better calculated to secure the aforesaid objects.

**IMPROVEMENT IN ROLLERS FOR FORMING AND FINISHING CAR AND WAGON AXLES**.—W. S. Mackintosh, Pittsburgh, Pa.—This invention relates to a new and improved method of constructing rollers for forming and finishing the axles of cars or wagons, whereby the same are more economically and perfectly formed and finished.