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 tuns 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 ⅛ 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.

ARCHÆOLOGICAL 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 archæologist, 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 tuns 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 immease, 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 commuication 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 fissure exhibits a silico-metalliferous 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 hight; 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 has 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 tuns of cotton while those of her rival manufactured 11,637 tuns. 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 phosphorous 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 tuns; length of rope, 3,700 feet; diameter, over two and one half inches, and weight twenty tuns.

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 admited, 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 American 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 ligneous 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. Hanger, 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 subterraneous 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 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, Minot, 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.—This 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 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, Catasauqua, 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 effected by unequal contraction or expansion than any now in use, and it consists in an improved form of wheel, where by 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.

CORN MARKER.—W. E. Phelps, Elmwood, Ill.—This invention relates to a new and improved device for furrowing or laying off ground in rows to receive seed corn. The invention consists in the application of three wheels to a frame constructed in a usual way, whereby, as the machine is drawn along, three furrows will be made, and the wheels allowed to conform perfectly to the inequalities of surface over which it may pass.

REEL FOR REAPING AND MOWING MACHINES.—Wm. F. Rundell, Genoa, N. Y.—This invention relates to an improvement in a reel for reaping and mowing machines, for which reel letters patent were granted to this inventor December 31, 1867.

SILL AND WEATHER STRIP FOR DOORS.—J. E. Linsley, Goshen, Ind.—This invention relates to a new and improved sill and weather strip, for which letters patent were granted to this inventor, bearing date June 19, 1866.

COMBINATION TOOL.—C. M. LOWE, Cincinnati, Ohio.—The present invention relates to a tool in which are combined, among others, a pair of calipers, dividers, and compasses, a surface gage, and a square.

COMBINED HARROW, DRILL, PLANTER, AND ROLLER.—D. B. Platt, Madison, Ind.—This invention has for its object to furnish an improved combined harrow, drill, planter, and roller, so constructed and arranged that the drill and roller, or planter, may be used together, or the roller and harrow may each be used alone, as may be desired, according to the particular work to be done.

SHOOTING GALLERIES.—James S. Conlin, New York city.—This invention has for its object to improve the construction of shooting galleries, so as to make them convenient for use, easily operated, and entirely safe.

MOLDING MACHINES.—E. H. Ripley, North Chelmsford, Mass.—This invention relates to a simple and effective machine for forming moldings, which is so constructed and arranged that by very simple adjustments the same cutter may be used for cutting moldings of many different designs, so that with an ordinary ogee cutter fifteen or more different designs of fancy moldings may be cut. The adjustments necessary for effecting these results are very simple and easily made. And the result is the production of a neat, compact, practicable, and useful machine, well calculated for use in the work shop.

WINDMILL.—J. Tobias Braun, Randolph Centre, Wis.—This invention relates to a new self-setting windmill, which is so arranged that the horizontal axle on which the wings or sails are mounted has bearings on both ends, thereby allowing the use of less clumsy apparatus, and doing away with much friction.

DAMPING APPARATUS FOR LITHOGRAPHIC MACHINES AND PRESSES.—Geo. Cooper, New York city.—This invention relates to a new device for automatically damping the printing surface and the edges of lithographic stones, so that in machine lithographic printing the required moisture may be imparted to the stone.

MACHINE FOR RAKING AND LOADING HAY.—John Adams, Transfer, Pa.—This invention has for its object to furnish an improved machine for raking and loading hay, which shall be simple in construction, effective in operation, and may be easily attached to a wagon and adjusted to carry the hay to any desired hight.

CARTRIDGES.—Richard J. Gatling, Indianapolis, Ind.—This invention relates to a new metallic-center cartridge, which is so arranged that the cartridge cannot be exploded unless it is struck in the center by the firing pin, or some other sharp instrument, so that the fulminate will be protected from the influence of moisture, and so that no gas can escape through the back of the cartridge when the same is exploded.

PORTABLE FENCE.—John Leonard, Basil, Ohio.—This invention has for its object to furnish an improved portable fence, strong, simple in construction, and easily put up, taken down, or moved from place to place.

GAGE WHEEL FOR PLOWS.—Gaius S. Deane, Grand Rapids, Mich.—This invention has for its object to furnish an improved gage wheel for plows, which shall be strong and durable, and which shall be so constructed that the parts most subject to wear may be readily detached and removed when worn, and replaced with new ones at a trifling expense.

QUILTING FRAMES.—Peter H. Mellon, St. Louis, Mo.—This invention has for its object to so improve the construction of quilting frames as to make them more convenient in use, enabling the quilt to be shifted and the frame taken apart and put together, or adjusted at any desired hight, quickly and conveniently.

LAMP SHADE.—Alfred M. Weekes, New York city.—This invention relates to a new shade for coal-oil and other lamps, which is to reflect the light upon a table or otherwise downward around the light, and at the same time to leave the upper part of the chimney free above the shade, so that the light may also illuminate the room from above the shade.

FANNING ATTACHMENT TO ROCKING CHAIRS.—Augustus R. Hobbs, Elizabethport, N. J.—This invention relates to a new and improved attachment to rocking chairs, whereby a rotating motion is communicated by the rocking of the chair to fans so situated as to cool and refresh the occupant of the same.

ORE FURNACES.—David C. Collier, Samuel Cushman, and Newell E. Farrell, Central City, Col. Ter.—This invention relates to a new and improved method of constructing furnaces for the washing and chloridizing of ores, whereby the same is more effectually and economically done.

STEAM HAMMER.—David Davy, Sheffield, Great Britain.—The object of this invention is to provide means for economizing steam in the use of steam hammers, or hammers actuated by any other elastic fluid, when such hammers are working with varying lengths of strokes.

MASH TUBS.—Leopold Klee, Pittsburg, Pa.—This invention relates to improvements in mash tubs for preparing mash for brewing and other purposes.

HYDRANT.—H. J. Bailey, Pittsburg, Pa.—This invention relates to new and useful improvements in hydrants, which embrace the construction and general arrangement of parts. The provision made for preventing the oxidation of the casing, and for removing the working parts from the case for purposes of inspection or repair.

DRILL CHUCK.—Eli H. Babcock, Canandaigua, N.Y.—This invention relates to an improvement in the method of holding and truing steel drills in lathes and drilling machines, whereby machine work is greatly facilitated, and whereby the process of drilling in iron, steel, or other metals, can be much more accurately performed than when done by drills held in the ordinary manner.

DOOR LOCK.—Richard C. Harrington, Newark, N. J.—This invention relates to a new door lock, which is so arranged as to be altogether burglar-proof; this is provided with two key-holes, one on the inside and one on the outside, but not opposite to each other; and is so constructed, that it can at all times be locked and unlocked from the inside, also unlocked from the outside, when it has been locked from the outside; but it cannot under any circumtances be opened from the outside if it has been locked from the inside.

PRINTING INK—Charles Wulsten, Lafayette, Ind.—This invention relates to a new and improved method of making printing ink whereby the cost of the same is greatly cheapened.

HORSE HAY RAKES.—Jonathan Hunsberger, Worcester, Mass.—This invention has for its object to improve the construction of wire toothed horse hay rakes, so that the driver by a simple movement of the foot lever can cause the rake to rise and discharge the collected hay.

MACHINERY FOR SPINNING.—A. L. Houghtaling, Philmont, N. Y.—The nature of this invention consists in a new and useful improvement in a spinning machine for drawing and twisting roping or roving, whereby the thread is drawn out evenly to any required degree of fineness, which improvement may be employed for spinning any kind of fibrous material.

CLAMP.—Gustavus V. Brecht, St. Louis, Mo.—This invention relates to a machine for boring out the centers of wagon hubs for fitting the boxes thereto, and it consists in the manner in which the clamps or jaws are formed by which the hub is held while the operation is being performed.

SCREEN AND SCOOP.—Agustus Thayer, Albany, N. Y.—This invention consists in a new and improved combination of a screen and scoop, whereby a scoop or small shovel may, with the greatest facility be connected with a screen whenever desired. The invention is applicable to fire shovels, and may be applied to scoops of all kinds.

WASHING AND WRINGING MACHINE.—Robert H. Tomlinson, Brownsburg, Penn.—This invention relates to a new and improved machine for washing or cleansing cloths and for wringing them at the same operation.

STAMPING MILL.—Richard Uren and John Walker, Honghton, Mich.—This stamping or quartz crushing machine is of that class wherein the piston is connected directly to the stamp head, without the intervention of a dummy shaft and crank in which it is desirable to operate the stamp so that it may have no variable throw, effected by an automatic valve movement, and it consists, first, in providing supplementary cylinders and pistons at each end of the main cylinder, to act as cushions against which the force of the stamp piston may be expended without damage, whenever from any cause the piston will be forced against the ends of the steam cylinders. Second, in providing a variable automatic cut-off to regulate the amount of steam admitted to the cylinder for raising the hammer or stamp. Third, in providing an adjustable outlet which may be so graduated as to regulate the discharge of water and pulverized ore from the machine. Fourth, in providing the stamp head with a flange of such shape as to throw the water and pulverized ore against the screens, in a manner more readily to separate the ore and discharge the pulverized portion from the machine. Fifth, in providing through the bottom of the mortar an outlet for those particles of ore which do not become sufficiently pulverized to pass through the screens, and which usually, in the machines as now constructed, become packed in the mortar so as to be difficult to remove.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

Ballston Spa, N. Y.—Twenty dollars received, said to be for second Government fee—no signature to the letter. Who are you?

W. H. B., of Texas.—Several devices have been proposed to overcome the resistance caused by running cars around curves. A divided axle is the well known plan, but it does not work well in practice.

D. L. G., of R. I.—Your electrical thermometer is not new. Such an instrument was described last year in the German Polytechnic Journal.

A. A. R., of Mich.—Your communication in regard to the sun's rising is a good one, but we have already devoted as much space to the subject as we can afford. The question is really one of very little practical value.

D. E. B., of N. Y.—"What should be the thickness of a coiled steel spring—number of wire—to sustain a weight of 300 lbs.?"—Probably the spring meant is a spiral spring. Its suspensive power, without setting, would vary greatly with the temper of the steel and the diameter of the spiral. It is doubtful if a rule could be established covering all the conditions.

C. C. S., of Pa., asks, "What is the process of marbleizing slate and other materials."

C. W. I., of Iowa.—We think Henry Carey Baird, 406 Walnut street, Philadelphia, may furnish you with a treatise on hydraulics which will contain a simple formula for calculating the rise of water above mill dams. Weisbach's formulas are intricate, but we know of none better.

J. C. E., of Miss.—We believe Capt. McClure did sail through a passage at the north of this hemisphere, and we have never seen the statement denied. The existence of a "northwest passage" we believe to be fully established. As to the reward said to be offered for this discovery we are not informed.

C. C. H., of Mass.—The greatest authenticated depth—72 feet—of the descent of a diving bell of which we have any knowledge was attained in the harbor of Portsmouth, N. H., and described in Vol. XXII of the *American Journal of Science*.

N. D. A., of N. Y.—"At a temperature of 212 Fah., the elastic force of steam just equals the pressure of the atmosphere. Does a gage showing a steam pressure of 70 lbs., per square inch indicate absolute pressure, or does it show only the pressure above 212°? In other words do our common spring gages begin to record pressure at 32° or 212° Fah?" Steam gages record the pressure of steam from a point above the equilibrium of the steam as generated and the atmospheric pressure.

L. F., of C. E.—Mix plaster of Paris with water from quicklime and it will be less liable to crack than with pure water. A little glue, dissolved, will not injure it.

J. B. S., of Ga.—"What is the greatest difficulty to be overcome in the construction of aerial machines?" Their direction and propulsion. For the first there is the changeableness of air currents, and for the second the slight resistance of the air. Beside these may be reckoned the impossibility of re-generating a gas of sufficient levity as needed. These difficulties appear to be almost insurmountable.

A. J. W., of Miss.—Fruit or vegetables when to be canned are partially cooked in a water bath and the can containing them suddenly stopped or cemented air-tight. The process requires some care, but can be easily learned. The idea is to expel the atmosphere by steam and before the steam entirely escapes to stop up the can so that no external atmosphere can get in.

E. J. H., of Kansas, asks if the pressure of the atmosphere will affect a belt conveying power from a source two hundred feet distant any more than from a distance of twenty feet. Certainly, the resistance of the atmosphere is greater on a large than on a small surface. In conveying power, however, by means of a belt for long distances it is seldom taken into account.

H. G. R., Jr., of Ill.—We have at present no pamphlet on the application of disinfectants in arresting the spread of the cattle plague. Carbolic acid is the best disinfectant of which we have any knowledge. Refer to past numbers of this paper for further information.

D. W., of Pa.—We are unwilling to give advice in regard to the use of arsenic as a medicine. You should consult an experienced physician. Persons ignorant of the science of medicine and symptoms should avoid dosing themselves with dangerous drugs.

G. H., of Miss.—Your communications are full of curious details, but it would puzzle a Philadelphia lawyer to decipher the peculiar style of writing which you have adopted. The compositer is very liable to grumble a good deal when such copy is put into his hands. If you desire to give publicity to your views you had better issue them in pamphlet form.

EXTENSION NOTICES.

John Mabie, of English Neighborhood, N. J., having petitioned for the extension of a patent granted to him the 3d day of October, 1854, for an improvement in pen and pencil case, for seven years from the expiration of said patent, which takes place on the 3d day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 14th day of September next.

Norman C. Harris, of Poultney, Vt., having petitioned for the extension of a patent granted to him the 24th day of April, 1855, for an improvement in manufacture of slate pencils, for seven years from the expiration of said patent, which takes place on the 24th day of April, 1869, it is ordered that the said petition be heard at the Patent Office on Monday, the 23d day of November next.

Business and Personal.

The charge for insertion under this head is one dollar a line.

NEW PUBLICATIONS.

POLAR MAGNETISM.

This is the published paper, by John A. Parker, read before the American Institute, and to which we referred in our criticism on the exercises of the Polytechnic Club, page 297, Vol. XVIII. Our opinion was by no means favorable, and having perused the pamphlet we are more strengthened than ever in our disapproval of its contents. Instead of being a contribution to the stock of knowledge, it is nothing but a confession by its author of his want of knowledge of a subject about which every philosopher of the present day should be well informed, and much more one who aims at giving public readings and issuing publications relating to it. Perhaps we had better state our grounds, in order not to be accused of being too severe or unjust.

The author possesses some information, he has of course read or heard something on the subject, but what he knows about it is very superficial, one-sided, and incomplete. He announces as a great discovery of his own, that the magnetic pole revolves around the geographic pole, and thus ignores entirely that this hypothesis is very old, and by later investigations has been proved utterly inefficient to the full explanation of the so very complex phenomena of terrestrial magnetism. He ignores the existence of the magnetic observatories established at the suggestion of Humboldt in different parts of the earth, and the important results lately obtained therefrom. He ignores the numberless irregularities and anomalies at different parts of the earth's surface, and, for instance, attempts to make out that the determination of the location of the magnetic pole by Captain Ross was erroneous, and because it does not agree with the declination in London, declares that Humboldt was wrong, etc., etc.

Then our author tries to prove, not with facts but with high-sounding words, that magnetism, electricity, and gravitation are all one; he calls the electricity developed by a revolving belt in a manufactory "magnetism," and says: "I have come to the conclusion that what we call polar magnetism is the result of magnetic force rendered active by revolution . . . . a latent force derived from latent principle and put in motion by a forward revolution." Clear as mud, this!

Then he says that the attraction of the needle is toward the center of the earth, and mentions an experiment with a needle magnetized only at one end, which he says will point perpendicularly downward toward the center. The mere mentioning of this experiment, which assuredly he never made but in his imagination, proves that he does not know the laws governing the action of magnetized bars, nor the influence of the earth on them, and that he has only a very obscure notion of the inclination or dip of the needle.

The variation of the compass he thinks to have explained by speaking of cosmical influences, and formally proposes again the long exploded idea of a shifting of the earth's poles, which, according to him, will eventually reach the equator, when that will be a frozen region. He thinks that this theory explains the fossil remains of equatorial plants and animals found near the poles, and thus seems to ignore that La Place has long ago proved the utter impossibility of such shifting of the poles in regard to the earth's mass, and the teachings of geology in regard to the transitions our globe has undergone.

As there is scarcely a page among the thirty-four this pamphlet contains which does not need correction or criticism, we have no space for further comment.

EXPERIMENTUM CRUCIS. By L. S. Benson.

This is a small pamphlet sent us by the author, in which it is at first not clear what he is driving at, but on reading the same it appears that he attempts to demonstrate that the common way of finding the circumference of the circle by the method of approximation, and the results obtained by this method are entirely erroneous. From a false proposition he deduces that the surface of a circle is exactly three times the square of its radius. As this is disproved by the inscribed polygons, which as soon as they have some sixty-four sides or more, are larger than this number, our author asserts that the calculation of these polygons gives an excess above the circle, consequently that the periphery of these inscribed polygons gets, some way or other, outside the circle as soon as they have numerous sides! Now, to show how this can be, he tries to prove that it is always the case in curves, and gives the calculation of the polygons inscribed in a parabola, and by some slight mistake he finds that the inscribed polygon of 512 sides is 0·0027 larger than the parabola itself, and then jumps to the conclusion that the polygon of 32,768 sides must be 0·1418926 larger than the circle in which it is inscribed. The whole reasoning falls utterly to the ground when we take into consideration that the number found by mathematicians by the method of approximation is verified not only by scores of other methods, but also by the most scrutinous practical trials, and by all astronomical calculations; that all thorough mathematicians agree perfectly about this number, and that the disagreement only is to be found among the circle squarers, one of whom found 3 (like our author), another 3⅛, another 3⅓, etc., etc., every one of them starting from false premises, and ignorant of the labor performed before them by others better informed than they.