

indefatigable investigation, are destitute of the sense of hearing; these facts going to prove the truth that the functions of the auditory and optic nerves become impaired by the partial or total deprivation of their natural stimuli, sound and light.

But on the other hand, excessive use of these nerves tends to their paralysis. The case of three boiler makers of this city made permanently deaf by hearing incessant hammering, was mentioned; also many cases of loss of hearing by artillerymen. In this connection it was incidentally mentioned, that the noise made by brass cannon affected the auditory nerves more painfully than that made by iron ordnance.

CONCERNING TEETH.

A note upon late experiments, relative to the readiness of digestion of varieties of food, brought up Mr. Fisher, who advocated the more thorough comminution of food on the score of health and economy. In the rambling discussion which ensued, one speaker presented the testimony of a late French savant, who maintains that the superiority of an Indian's teeth, for example, is due to the fact that, from insufficient cooking of their food, they are obliged to make great use of them; that the dentist's occupation was a sign and concomitant of excessive civilization. The dentists present denied the charge, affirming that rudimentary teeth of both sets were formed before the birth of the child; that the mastication of food in no way entered into the question, excepting perhaps in the case of the mother; and that the Indian had better teeth simply because the constitution of the generality of their females was better than that of the civilized woman.

Some other topics of minor note occupied the controversial powers of the members during the remainder of the evening, and the Society adjourned at a late hour.

Birkhols' Metal.

We see it stated in the papers that A. Birkhols, formerly of Colt's factory in Hartford, the inventor of a metallic composition resembling brass, for the manufacture of which a company has been formed in Providence, R. I., with a capital of \$300,000, has sold his patent to them for \$40,000 of the stock, three cents duty on every pound manufactured, and a salary of \$4,000 for superintending the manufacture.

The following is a copy of the patent:—

Be it known that I, Alexander Birkhols, of the city and county of Hartford and state of Connecticut, have invented or discovered certain new and useful improvements in the composition of cast metal, by means of which greater strength is acquired, and I do hereby declare that the same is described in the following specifications.

So as to enable a person skilled to make the same, I will therefore proceed to describe its component parts, the essential ingredient of which is cast iron. To make one hundred pounds of this composition, I first take two pounds of cast iron, two ounces of charcoal, put into a crucible and heat to a white heat. I then add thereto sixty pounds of copper. Heat till both are melted together, then add four ounces of borax and thirty-eight pounds of zinc.

The mode of proceeding during the melting is much the same as with all other metals melted in crucibles. When melted it may be poured into molds or bars suitable for the forge or rolling mill. Its strength is estimated to be eight thousand pounds greater to the square inch than the best wrought iron, rendering it far more valuable for various purposes.

The proportion of parts may be varied, which will only change proportionably the desired effect, viz., greater amount of strength and solidity; but I believe that the proportions about as described will be best for all practicable purposes. I have described its component parts and the mode of proceeding to produce my improved composition, so as to enable a person skilled to make the same.

What I claim, therefore, and desire to secure by letters patent, is the introduction of cast iron into a composition composed of copper and zinc in about the proportion, substantially in the manner as described.

ALEXANDER BIRKHOLS.

The Uchatius Process.

Many of our readers will still recollect an interesting invention made by M. Uchatius, an officer in the Austrian service, and which was first brought under public notice at the Paris Exhibition of 1855. It is a direct method of steel manufacture by mixing granulated cast iron and iron ore, in proper proportions, in a crucible, and by these means forming the exact combination required for any given quality of steel. In 1856, at the same time when Mr. Bessemer's invention had been pronounced to be a failure, this process was at the height of its renown, and experiments were made in France and in England on a more or less large scale, although not in anything like commercial practice, to test its value. A company was formed in France, and, we believe, under the auspices of the Government, for the working of M. Uchatius's patents, and everything then believed to be necessary for steel manufacture on a large scale was provided. The causes of failure in this instance are now perfectly intelligible, since the advancement of what may be called the science of steel manufacture has, since that date, enabled us to judge of the importance and value of certain details which were then unknown or overlooked, and the absence of which caused the practical failure of a process which in principle was perfectly correct, and would have in time become of considerable importance, had it not been surpassed by the progress of a still more glorious and revolutionizing invention, viz., the Bessemer process. The Uchatius process, however, has been commercially introduced at one place, and the steel works has continued its operations now for about ten years, and so far as can be judged from the excellent quality of its products, and from the continuance of this mode of manufacture with perfect success. The steel works referred to is at Wykmanshyttan, in Sweden. In 1862, this concern sent Uchatius steel to London, which was remarkable for its tenacity and uniformity of grain, and now in the Paris Exhibition we find the same

works represented by another excellent collection of the Uchatius steel. We understand that the Uchatius steel of Wykmanshyttan is used exclusively by the royal mint at Stockholm for dies of coining presses, polished rolls, and other similar articles requiring steel of great strength and closeness and uniformity of grain. The reason why this process succeeded in Sweden and failed in France and in England is the same which made the Bessemer process first succeed in that country, viz., the purity of the Swedish ores. The ore employed for the Uchatius process at Wykmanshyttan is that of the Bisberg mines, which can be seen in its natural state at the Paris Exhibition, forming part of the large trophy of ironstone and iron erected in the Swedish machinery gallery. It ranks among the purest and richest magnetic ores to be found anywhere. From this ore and from granulated pig iron made of the same ore, probably mixed with iron containing manganese, if the original granulated iron does not contain a sufficient dose of this latter metal, the Uchatius steel is made. The production is not inconsiderable, and the article finds a market at Gese, principally in the form of a bar steel of small dimensions, at a price of 30s. to 35s. per cwt. Uchatius's process would have become a practical success in England, had it not been swept away by Mr. Bessemer's invention before it had time to establish itself in practice. The steel manufacturers of this country and the public at large have all reason to be satisfied with the historical coincidence of the two inventions, since there would otherwise, and had Bessemer followed behind Uchatius, have been two revolutions to be passed through instead of the one which has taken place. We should have had to change from the old mode of steel conversion to the Uchatius process, and ultimately again from that to the Bessemer process.—*Engineering.*

Animal Grafts.

Plastic surgery recognizes life in a part and grafts one portion of the body on another, or replaces a portion of a nose or a finger when lopped off, and witnesses its continued growth. In lower animals this principle is more astonishingly developed. Cut a polyp into a dozen pieces and each fragment will develop itself into an independent and perfect type of the species. A French naturalist, M. Vulpian, cut off the tails of tadpoles, and saw them not only live but grow for ten days, indifferent to all theories of nervous centers, digestive apparatus, or circulatory systems. But the member that seems to have the strongest dose of the "vital principle," is the tail of a rat. This is the very ideal of life, and here, if anywhere, we ought to locate the seat of vitality. The following experiment was made by Mr. Bert. He dried a rat's tail under the bell of an air pump, and in immediate proximity to concentrated sulphuric acid, so as gradually to deprive it of all moisture. Then he placed it in a hermetically sealed glass tube for five days. At the end of this time he subjected it for a number of hours to a temperature of 98° Cent. in a stove, and subsequently sealed it a second time in his tube. Four days more having elapsed, he united this tail by its cut extremity, to the freshly cut stump of a living healthy rat, and quietly awaited the result. His success was as complete as it was marvellous. It commenced to expand and perform the natural duties of a tail, and three months afterward he demonstrated by a second amputation, and a careful injection, that it was furnished with proper vessels and was a living part of the second rat!

What rich lessons practical surgery may learn from such experiments, can be imagined. A careful anatomist has transplanted a fragment of bone from the skull of one rabbit to the skull of another, and found it form adhesions and replace the lost portion perfectly. A piece of periosteum taken from a rabbit twenty-four hours after death, grew and produced bone when grafted neatly on a living animal of the same species. Nerves also have been removed from one body to another with success, and some very singular results noticed where a portion of a motor was excised and supplied by a fragment of a sensory filament. The diseases to which grafted members are subject, after they have been exposed to certain re-agents, are also full of hints for the pathologist and the physician.—*Medical and Surgical Reporter.*

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The East India telegraph is progressing through China.
There is only about a quarter of the shipping tonnage building in Maine at present compared with last year.
England uses 850 million postage stamps annually, France 450 and the United States 350 millions.
The efforts of the French Emperor to increase the extraction of coal in France, have been so far successful that from 13,000,000 to 14,000,000 tons will probably be mined this year. Rather an insignificant amount compared with the coal production of America or England.
The cities of Bombay and Singapore, India, have for two years past been lighted with gas made from coal brought from Australia. This coal besides being cheaper, is quite free from sulphur, so that the gas is easily purified, and a larger supply of coal may be stored without deterioration or danger from heating.
The ties for the Kansas Pacific Railroad will cost a dollar each. The coal must be transported 200 miles.
The Prussian King has accepted the present by Krupp of his monster gun now in the Paris Exposition, and its ultimate destination will be some coast battery.
A California paper says that the company engaged in taking out borax in Lake county, will soon be in condition to extract five tons of this article per day from the Borax Lake.
Gold dust to the value of \$800,000, arrived at St. Louis, from Montana, on the 9th inst., the largest consignment received at one time.
Maine claimed recently to possess the oldest locomotive in America. It was broken up the other day at a Bangor machine shop. This locomotive was the "Pioneer," a ten ton engine, and was one of the early machines built in England by Stephenson, the inventor of the locomotive. It was built at Newcastle-upon-Tyne, in 1825, and ran its first trip November 6, 1835. Its last work was done August 15, 1867.

Diamonds have been found in the Cape colony, in the neighborhood of the Orange river, by some Amsterdam prospectors; one of the gems is valued at \$5,000.

It appears from quarterly returns made by the various manufacturers of sewing machines in this country, that during the year ending June 10, 1867 there were manufactured and sold 151,135 double-thread, and 13,970 single-thread machines.

The first paper mill built in the United States was erected at Roxborough, Pa. 1638. The second mill was built at Elizabeth, N. J., in 1723, during which year the first mill in Massachusetts was built in Boston. In the year 1860 the number of paper manufactures in the United States was 355, their total product, being valued at \$21,216,862. Of these manufactures New England had 204; the Middle States 273; the Western States 51; the South 24. The increase since that year has been very large.

The American Fishhook company of New Haven, Conn., turn out from each machine, one hundred fishhooks per minute.

The Boston Hartford and Erie railroad by the first of next month will have their road in operation to Mechanicsville, Ct., where a junction will be made with the Norwich and Worcester railroad.

The largest journal turbine wheel ever built in the country, is being constructed for the Fairmount water-works of Philadelphia. Its diameter is ten feet three inches: weight, including gearing etc., about 200,000 pounds.

Some of the Lowell cotton mills which have been slackening up for a few months past, are again pushing business.

The amount of capital expended on the Suez canal, last year was \$10,600,000. The estimated amount still required to be expended before the work will be completed, is said to be \$29,600,000.

For improving the navigation of the Mississippi river, Government has authorized the construction of a canal seven and a half miles in length, around the Keokuk rapids. The contract for the removal of obstructions in the rapids just above Rock Island, has been awarded, and among the novel means for rock excavation, is an immense drill weighing over four tons, which with a fall of thirty feet, it is reported, plows into the solid rock more than four feet at a single stroke. It would interest us to be informed of the structure of the rock where such extraordinary results could be attained.

Work on the Macon Gap railway, is progressing very rapidly about three hundred hands being employed. The rails are now being laid between Piedmont and Marietta, and the track graded and readjusted to the summit of the Blue Ridge.

The production of coal this year has not reached that of 1866 but the great falling off in the demand for manufacturing purposes has caused a great reduction in rates. Prices are now so low that the mines are not making any money, and it is predicted that many small companies formed during the past two or three years, must succumb to the general stagnation.

The first sample of pig-iron ever made on the Pacific coast is on exhibition in San Francisco.

The contract for building the mountain section of the Pacific railway, some six hundred miles in length, has been awarded to Mr. Charles Ames, who is to receive therefor over \$47,000,000. This is the largest railway contract ever made in this country.

The California gold mines are said to be yielding more freely than ever before. As a specimen; near Smartsville upwards of \$1,000,000 of gold have been taken from one claim of 100 acres, since March 1864. "It takes a mine to work a mine" says an old Spanish proverb, and to open the mine under notice, took nine years of incessant labor, and an enormous expenditure of money. It has four miles of sluices, three rods wide and three feet deep, in which is distributed three tons of quicksilver to catch the gold. The water used in washing costs \$25,000 per annum, and 125,000 pounds of powder are expended annually in blasting.

Recent American and Foreign Patents.

Under this heading it is shall publish weekly a list of some of the more prominent new inventions and foreign patents.

ATTACHMENT FOR GRAIN CLIPPER OR HEADER.—Samuel Manning, San Francisco, Cal.—This invention relates to a new machine to be attached to the ordinary clipper or header, for the saving of grain, which is fallen or blown down, commonly termed "lodged grain."

CARRIAGE SPRING.—Thomas De Witt, Detroit, Mich.—This invention consists in the application of fixed studs to a carriage spring, composed of two parts connected together and arranged in such a manner that a spring superior to the ordinary elliptic spring is obtained.

LOUNGES, SOFAS, BED BOTTOMS, CHAIRS, ETC.—Casper Martino, Trenton, N. J.—This invention has for its object to furnish a neat, convenient, secure, and reliable means of securing coiled wire springs, in a position in lounges, sofas, chairs, bed bottoms, etc., and for raising and lowering a movable part of such articles.

DEVICE FOR HITTING HORSES.—J. B. Thornton, Madison, Wis.—This invention relates to a device to be attached to the inside end of carriage wheel hubs by means of which, if the horse or horses harnessed in and to the carriage be hitched to such device, upon any attempt to move forward the wheel is turned sufficiently to draw in the rein, and thus to stop them; while if they move backward, the device is free to slip around the wheel hub, and no harm thus occasioned.

SPADE.—W. H. Miller, Brandenburg, Kentucky.—This invention consists principally in a novel attachment of the handle for operating the tines constituting the rake, to throw them into position for use as a rake or as a spade.

RAILROAD STATION INDICATOR.—George T. Lape, Summit, N. Y.—This invention relates to a new and useful mode of constructing apparatus for indicating to passengers in the railroad car the names of stations as they approach or pass them, in the distance, between them and the terminus of the road.

DEVICE FOR MIXING FLUIDS.—George Watkins, Brooklyn, N. Y.—This invention relates to a new and improved device for mixing and agitating fluids, and it consists in a novel means employed for operating the revolving beaters whereby the latter have two motions, a rotary one on their own axis, and another in a circle, around the tub or receptacle in which the fluid to be mixed is placed.

PETROLEUM STEAM HEATER.—Lewis R. Wiggin, Farmington, N. H.—This invention which relates to device for heating tar, wax, glue, blacking, oil, and other articles used for chemical and mechanical purposes, consists of a double bottomed tank or receptacle for the substance to be heated, and of a standard through which water is conveyed between the two bottoms, and rising into a steam generator, from the top of which passes a worm coiled in the tank. A chimney passes through the steam generator, at base whereof a petroleum or kerosene lamp or other source of heat is placed.

BETTER FOR SAW MILL.—Titus Whitmore, Dubuque, Iowa.—The object of this invention is to provide a device by which the logs may be set automatically to a circular mill saw for manufacturing lumber, and consists in providing an index plate made in the form of a disk with a cam, and a crank lever located upon a shaft, for the purpose of throwing off the set of the log to the saw, when it has gained the point designed for the thickness of lumber.

LADDER.—B. F. Turner, Bridgeton, N. J.—This invention consists in the application of hooks to one of the sections or lengths of the ladder, whereby the uppermost section or length may be adjusted to reduce the length of the whole ladder, as may be required. The improvement further consists in the application of a base whereby the ladder may be held firmly in an upright or slightly inclined position, without leaving it against any support. The improvement consists, lastly, in an adjustable or reversible platform, whereby the device may be used as a slip ladder.

SECURING KNOBS TO THE ARBOR OF LOCKS.—D. B. Cobb, Jersey City, N. J.—This invention relates to a new and improved means for securing knobs to the arbors of locks, whereby a very strong and durable connection of the aforesaid parts is obtained, and one which admits of a very ornamental and chaste appearance being given the knob.

DEVICE FOR BENDING OR SWAGING SHEET METAL PLATES FOR COVERING SASHES FOR GREEN HOUSES, SKYLIGHTS, ETC.—John N. Woodward, Aurora, Ill.—This invention relates to a new and improved device for bending or swaging sheet metal plates for covering the exterior portions of sashes for green houses, skylights, etc. The object of the invention is to obtain a device for the purpose specified, which will be simple in construction, capable of being manipulated with facility, and which will admit of the work being performed with rapidity and in a perfect manner.

HYDRO-CARBON VAPOR MACHINE.—James T. Spence, Brooklyn, N. Y.—This invention relates to a new and improved machine or apparatus for vaporizing volatile hydro carbons for illuminating purposes, and consists in a novel and improved means for creating a draught of atmospheric air through the chambers containing the material to be vaporized, such for instance as the light grades of coal oil, naphtha, gasoline, etc., and also in improved valves for checking the draught whenever the apparatus ceases its operation. The invention finally consists in the use of a combination of heavy hydro-carbons, or those which vaporize at quite a high temperature with that of a lighter grade, whereby all danger of explosion is avoided. The invention nas for its object the production of a steady light, a large vaporizing surface within a limited space, and safety from explosion in using the apparatus.

CULTIVATOR.—Isaac B. Mahon, Dunkirk, Ohio.—This invention relates to a new and improved cultivator for cultivating crops which are grown in hills or drills, and it consists in a novel construction of the device whereby a very durable implement, for the purpose specified is obtained.

TRUSS.—Frederick W. Neubert, Pittsburgh, Pa.—This invention relates to a hernia truss which is so arranged that it can be applied for ruptures on either side, or even for double ruptures, and can be adjusted on bodies of different size.

MANGER, FEED BOX, ETC.—Friedrich Denzler and Jacob Miller, Brooklyn, E. D. N. Y.—This invention relates to such a connection of mangers, feed boxes, or feed troughs, with ordinary clockwork, that the same can be automatically opened at the necessary time, not requiring any attention after the boxes or troughs have been filled, closed, and the clockwork arranged. The object is to economize time and labor, especially in large dairies, studs, and stables, and to provide regularity in the time of feeding, the apparatus being so arranged that any desired number of troughs or boxes will be simultaneously opened from or by means of one clockwork, with which they are connected.

ICE-CREAM FREEZER.—Francis H. Duc, Charleston, S. C.—This invention relates to a new device for freezing ice cream, and consists in the use of a revolving cylinder in which the cream is held, said cylinder being fitted around a stationary shaft which carries a wing for feeling or indicating the state of the contents.

HOSE COUPLING.—John Kerns, New York city.—This invention relates to a hose coupling of such construction that two pieces of hose can be secured to each other by its use, without a wrench, or even without turning a ring or a nut for the purpose. All that is required to connect two ends of hose is to hold them together, and push one toward the other, and the connection will be complete, safe, and strong.

GARDEN TILE FOR BORDERING.—Francis B. Fancher, Lansingburgh, N. Y.—This invention relates to an improvement in the construction of tiles for the edges of walks, flower beds, and grass plots, in gardens and other ornamental grounds, and consists in forming the tile with a right-angled wing or wings, on one or both sides, and locking the tiles together with lap joints, or tongue and groove, in such a manner that they may be set in the ground with one edge projecting above the surface to divide a flower bed or grass plot from a walk, or to enclose a border on both sides.

MODE OF SECURING FELLY JOINTS.—James W. Lawrence, New York city.—The nature of this invention consists in securing the ends of fellys in a wheel by means of a bolt through the joint and the felly-plate in such manner that the ends will not split or crack when the tire is set up, nor work loose and uneven laterally and radially from service, but will form a tight joint of great strength and durability.

THREE WHEELED VEHICLES.—John W. Minor and David P. Ward, New Bedford, Mass.—This invention relates to improvements in wheeled vehicles, and it has more particular reference to those vehicles which are used for the transportation of heavy burdens, as trucks or drays, and it consists in the peculiar arrangement of a third or guiding wheel to the forward end of the said vehicles.

DISTANCE INDICATOR FOR VEHICLES.—James C. Spencer, Phelps, N. Y.—This invention relates to an improvement in the construction of an odometer, or distance indicator, for vehicles, and consists in a spur wheel placed in a box to be attached to an axle of any vehicle which is revolved by means of a screw or worm that receives motion by means of a pawl and ratchet, with every revolution of the wheel.

TRACE AND PAD BUCKLE COMBINED.—E. B. Winslow, Chatham, Ill.—The object of this invention is to fasten the trace and pad strap with a buckle, serving the purpose of two buckles, usually employed, making a large saving of strap leather in the harness, while the pad is lighter, stronger, and neater, and cheaper than any in use.

HARVESTING MACHINE.—J. M. Peters, Jr., Ganville, Ohio.—This invention relates to a new and improved harvesting machine, designed for general purposes, to wit, the cutting of grass and grain and standing corn stalks, and it consists in a novel construction of the frame of the machine, arrangement of the driver's seat, cutting device, etc., whereby the device is rendered capable of operating perfectly in cutting all standing crops.

WATER AND GAS METER.—Joshua Mason, Paterson, N. J.—This invention relates to a new and improved water and gas meter, and consists in a novel construction and arrangement of parts whereby water or gas may be measured in the most accurate manner and by a means not liable to get out of repair or become deranged by use.

CULTIVATOR.—Elijah Stafford, Decatur, Ill.—This invention relates to a new and improved cultivator of that class which is designed for cultivating crops grown in hills or drills, and consists in a novel arrangement of crank axles whereby the plows may be adjusted higher or lower, so as to plow more or less deep, as required, and all the plows of the machine graduated so as to plow an equal depth. The invention further consists in a novel arrangement of the plow standards and in a peculiar shape of the plows, whereby the latter are prevented from clogging or choking.

MODE OF COVERING STEEL WITH COPPER.—E. T. Ligon, Demopolis, Ala.—This invention relates to the covering of steel with copper.

PISTON.—Nathan Hunt, Salem, Ohio.—This invention consists in so forming and arranging the parts that no holes, valves, or springs are required, while the piston is self packing, the rings being expanded by the pressure of the steam.

SUBMARINE PLOW.—Edwin T. Ligon, Demopolis, Ala.—This invention consists in attaching to the side of a steamboat or other vessel a submarine plow which by its action on the bottom of rivers and other waters displaces the sand, mud, and other loose material, and thereby excavates a channel and deepens the water for purposes of navigation or for other purposes.

ADJUSTABLE MEASURE FOR PACKING LIQUIDS.—Joseph L. Abbott, North Providence, R. I.—This invention relates to a new and improved measure whereby liquids may be drawn from a tank or reservoir in certain limited quantities very expeditiously. The invention is more especially designed for the drawing off of coal oil and turpentine from large tanks or reservoirs in specific quantities for canning, and has for its object the varying of the capacity of the can to suit the variation of measurement peculiar to different countries, as the gallon, for instance, which varies materially, an "imperial" gallon being larger than the gallon United States measurement. The invention has further for its object the ready admission of the oil or other liquid into the measure by providing a free escape for the air therefrom during the process of filling; and finally the invention has for its object a speedy withdrawal of the contents of the measure without loss by leakage or drip in drawing the cans to or removing them from the discharge faucet of the measure.

ROLLING MACHINE.—Hugh Baines, Manchester, England.—This invention relates more particularly to a rolling machine invented and secured by Letters Patent of the United States bearing date Dec. 11, 1860.

TUBE EXPANDERS.—E. J. Moore, East Boston, Mass.—This invention consists in arranging a stock with a number of rollers placed therein with beads formed on them, which rollers are so adjusted in the stock that they can be forced outward by a tapering pin which passes through the stock and operates upon the rollers.

COMBINED HOE AND RAKE.—Isaac Cook, Haynesville, Mo.—This invention relates to an improvement in the construction of a combined hoe and rake, and consists in a device for securing them to the handle together or separately.

WINDOW SASH.—Robert Thomas, Parkersburgh, West Va.—This invention has for its object the fitting of the sashes within the frame of the window in such a manner that the sashes may be removed from the window frame and fitted therein with the greatest facility, and without removing or detaching stops, parting beads, and other parts pertaining to a window frame, as is now necessarily required.

BALING PRESS.—S. J. Austin, Freeport, Me.—This invention consists in novel means employed for operating the platen and the expanding side of the press box, and also in a peculiar construction of the platen and head block, and other features, whereby a very simple, efficient, and durable press is obtained, and one which may be operated or manipulated with the greatest facility.

CHURN DASHER.—J. W. Pettingill, Rockford, Ill.—This dasher for churns in fact embraces two in one it working to crush or mash the cream without a rubbing or grinding movement, which as is well known, has a tendency to leave the butter soft and salvy while it mashed or crushed it is rendered hard and brittle.

WEATHER STRIP FOR DOORS.—J. H. Miller, Milwaukee City, Wis.—This invention consists in so hanging and arranging the weather strip that when the door is closed it will be brought down and upon the sill of the same in proper position for preventing the passage of air, dust, etc., under the door, while as the door is opened it will so swing or turn as to pass freely over the sill and offer no obstruction to the movement of the door.

CART.—N. W. Godfrey, Locust Valley, N. Y.—This invention principally relates to the construction of the bottom of a cart whereby, when so desired, it can be simultaneously opened at various points of its length and width for dumping the material contained in it upon the ground or any other desired place and in the most easy, convenient and ready manner.

DOUBLE-ACTING FORCE PUMP.—John C. King, New York City.—This invention relates to a steam pump in which the circumference or rim of the cylinders is connected with, attached to and moving with the piston, between the stationary heads, thereby doing away with piston rods and piston packings. The ports pass through the stationary heads, and the water or steam is acted upon by the motion of the piston in the same manner as in ordinary cylinder engines.

PORTABLE SHEEP SHED.—Wilson M. Baker and John Hisner, Urbana, Ohio.—This invention has for its object to furnish an improved portable sheep shed so constructed and arranged that it may easily be transported from place to place, and that the sheep may be protected from the weather and easily and conveniently fed.

BOLT.—A. H. Sherwood, Southport, Conn.—This invention consists in the combination with two bolts which are connected together by a toggle, the one for securing the top of the door, and the other the bottom, and of a catch so arranged as to automatically catch upon a hook or the like secured to the siding of the house or building for holding the door open.

HORSE-POWER.—S. Coin, Cazenovia, N. Y.—This invention relates to that class of horse-powers in which an endless platform is employed on which the horse travels and thus imparts power, and it consists more particularly in a novel construction of the link pieces for the several sections of the platform in their application and attachment to the platform sections, the iron tie rods heretofore used are dispensed with, and the machine not only much simplified but made lighter, and its cost of construction diminished.

FRUIT BOX.—Israel F. Brown, New London, Conn.—The objects of this invention are first, to construct a fruit box in such manner as to avoid all shrinkage of the wood of which the box is made, and second, to obtain a simple, cheap and efficient fastening device or devices for the bottom to the sides or other portions of the box.

BELTING FOR MACHINERY.—M. A. Strouville, St. Louis, Mo.—This invention or discovery relates to a new and improved mode of making belting for machinery and consists in preparing and curing hides without tannin.

CARRIAGE JACK.—Joseph F. Emmert, Quincy, Pa.—This invention relates to a new and improved carriage jack which is operated by a lever to raise a sliding rack. It is made wholly of cast iron and is both cheap and convenient.

PRESERVING MEATS, GAME, ETC.—Edward de la Granja, Boston, Mass.—This invention is designed for the preservation of all kinds of meat, game, poultry, etc., used for human food, and when the process is properly followed it will preserve such meats, etc., in a perfectly sweet and edible condition with but a trifling expense.

SHIFTING RAIL FOR CARRIAGE TOPS.—Patrick G. Clancy, Augusta, Me.—In this invention the carriage top is fixed to a rail which can be easily attached to or detached from the seat. The means for attaching and detaching it are short hooked projections on the rail catching in eyes in plates attached to the seat and held in position in the eyes by shortening the rail. The rail is made extensible by means of an independent piece screwed into its center, by right and left screws.

HERNIA TRUSSES.—William Pomeroy, Brooklyn, N. Y.—This invention has for its object to so improve the construction of hernia trusses, abdominal supporters, etc., that the tension of the body spring and the position of the pressure pad may be adjusted at pleasure.

CLOTHES DRYER.—D. B. Randall, and A. A. Williams, Glover, Vt.—This invention has for its object to furnish an improved clothes dryer, simple in construction easily and conveniently used and operated and which will occupy little space in the room in which it is placed.

CHURNING MACHINE.—M. V. B. Rowley, Worcester, N. Y.—This invention has for its object to furnish an improved machine by means of which a churn may be operated at any desired speed, steadily and regularly, bringing the butter in a very short time.

FENCE.—Daniel Kaufman, Boiling Springs, Pa.—This invention has for its object to furnish an improved fence so constructed and arranged that the posts will be no more liable to decay than the boards or rails, which may be easily set up and taken down and conveniently moved from place to place.

FOLDING CHAIR.—E. W. Vaill, Worcester, Mass.—This invention relates to that class of folding chairs in which the seat is supported on crossed legs which fold together; and consists in a new method of constructing and hinging the arms and back of such chairs, by which the whole chair is more neatly and compactly folded together, the back folding forward over the seat, and hanging in front of the legs.

FOLDING CHAIR.—E. W. Vaill, Worcester, Mass.—In this invention a new method of pivoting the arms to the front part of the seat is employed, by which the chair is more neatly and compactly folded together.

ROUNDING FLY NET STRAPS.—Cornelius K. Burkholder, and Henry Lerew, York Springs, Pa.—This machine has two jaws, one movable; to these are attached guides whose apertures correspond with the square shape of the strap as it is fed into the machine, and knives whose semi-circular notches give the required rounded form to the passing strap.

GRINDING MACHINE.—Menno A. Dieckrichs and J. H. Dieckrichs, Baltimore, Md.—This invention relates to an automatic arrangement for holding and feeding the article to be ground in relation to the stone, and in the means for adjusting the different parts to suit different sizes of tools etc.

VEGETABLE PLOW.—Wm. Richardson, Hookstown, Md.—In this invention of the three plow points, the forward one is removable and the two rear ones are adjustable both laterally and vertically. The object of constructing a plow in this manner is to adapt it to plowing between rows of different distances apart, and to adjust it either to surface or subsoil plowing, as may be desired. It also pulverizes the ground more thoroughly than the common plow.

INVALID SPITTOON.—John M. Cayce, Franklin, Tenn.—In this invention the cover of the spittoon is raised by the act of lifting the instrument and falls by its own weight when the spittoon is set down again.

WASHING MACHINE.—Albert Dennison, Stillwater, N. Y.—This invention relates to that class of washing machines in which the clothes are placed in a revolving box, together with loose balls, and cleaned by the action of the balls, in connection with the water. The invention consists in making the box a polygonal prism, instead of a cylinder and in the peculiar construction and attachment of the journals and journal boxes.

IMITATION WOOD.—Henry Carter, Taunton, Mass.—This invention relates to a new composition for making imitation wood from the dust of those kinds of wood which it is desired to imitate, and to a new process of ornamenting such imitation wood by means of metal shavings.

PIN.—A. R. P. Walker, Richmond, Me.—This invention relates to an improved pin for brooches, shawls and like purposes, and consists in dispensing with the rivet and hinge as ordinarily used by bending the pin itself through the eye.

PUNCH.—Edward Shindler and Charles H. Metzger, Easton, Pa.—The object of this invention is to construct a tool for punching leather or any other material of a similar nature in an accurate and expeditious manner.

FURNACE FOR SMELTING ORES.—A. H. Richardson, Denver, Colorado.—This invention, which relates to an improvement in furnaces for smelting silver, consists in directing a blast upon the treated ores with charcoal in a furnace having three apertures at different levels for the separation of the slag silver and lead by gravitation.

COMBINED CHAIR, LOUNGE AND STEP LADDER.—Joseph Gerdon, Jr., West Albany, N. Y.—This invention relates to a new and useful device which will be of great use in stores and magazines of all descriptions and which is so arranged that it can be set up as a chair, step ladder or lounge, as may be desired.

TRACE ATTACHMENT.—Andrew Thompson, Ottumwa, Iowa.—The nature of this invention consists in attaching to a harness trace a metal point or end having ratchet teeth or a series of projections on the upper side which catch a clamp for fastening the trace.

STEAM ENGINE.—Thomas Adams and George John Parson, Adelphi, Eng.—This invention consists in certain improvements in slide valves, which are also applicable to pistons and glands. The object is so to construct a valve that the effect of the steam, acting on the back of the valve shall be equal to the effect of the steam acting on the face of the valve; but should the surfaces acted on by the steam not be opposite each other, then the areas of such surfaces, multiplied by the distance of their centers of action from the center of the valve (being the leverage with which the steam acts) should be made equal.

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 advertisements at 50 cents a line, under the head of "Business and Personal."

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

N. U. A., of Mass., asks if we can inform him of any cement for steam pipes which cures quickly and is durable? We know of no better cement than that ordinarily used, composed of red and white lead mixed with linseed oil. It sets readily, especially when subject to compression. Our correspondent is, of course, aware of the constituents of the permanent joint made of iron borings, sal ammoniac, sulphur, and water. The proportions of both the above we have published several times. Rubber makes an instantaneous joint without cement.

E. V. R., of Mich.—The molds or matrices for casting glass bottles having raised letters or other devices on their exterior surfaces, are made of iron or brass and produced by casting from a wooden pattern, then finished up and fitted with the proper hinges or connections. The process is as simple as any other job in pattern making, molding, and finishing.

S. J. T., of Ga., desires a recipe for making the plaster of Paris stick to mill stones. Much of his work in this line puffs up and soon comes off. We know of no mystery in this operation. The requisites are fresh plaster and a clean stone.

C. R. C., of Ill. has a twenty-four inch gum belt which slips on the pulleys, one of which is of iron and the other of wood. He is told that tallow will spoil rubber belts, has used rosin, but it seems to glaze the belt and make it worse than before. Ans. Animal oil will not do for rubber belts. If the belt slips it should be lightly moistened on the side next the pulley with boiled linseed oil—cold—and repeated if one dose does not answer.

J. H. S., of Ohio asks how he can harden and temper the boards for cultivator plows, which have to be heated and pressed to form, without danger of their springing. We know of no certain way of tempering curved sheets of steel without springing, except hammering to shape after the tempering is done.

J. S. L., of Pa.—For producing the different grades of brass, etc., we refer you to the "Timman's Manual," published by I. R. Butts & Co., Boston, Mass. We have published the recipes several times.

E. W. D., of Conn.—In our statement on page 121, current Vol., that we "did not know of any dynamometer to be applied to the shaft which is entirely reliable," we intended no injury to any inventor of dynamometers. If the machine you speak of is so entirely reliable under all circumstances the fact has escaped our notice, although we are tolerably well acquainted with the machine. Its superior merits ought to procure its general introduction and obviate the necessity for a better measurer of power.

L. M. C., of Iowa.—In 1663, the magnetic and geographical meridian of the city of Paris coincided. From this time forward the declination proceeded westward till it reached its maximum in 1814 when it was 22° 34' W. Since 1814 the declination has receded. In 1860 it was 19° 33' W. In London it was 0° in 1663, reached its maximum west declination of 24° 41', in 1818, and was 20° 25' W in 1866. The line of no variation is an irregular line, and at present cuts the east of South America, passing east of the West Indies, enters North America near Philadelphia and traverses Hudson's Bay, thence it passes through the North Pole, entering the Old World east of the White Sea, traverses the Caspian, cuts the east of Arabia, turns then toward Australia, and passes through the South Pole to join itself again. No satisfactory explanation has ever been given of the variation of the needle.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Iron Manufacturers and Capitalists.—Examine the Model Rolls at the American Institute. Patent for sale. P. Bright, Philadelphia.

For Sale.—A small Metal-working Shop—Tools in good order. Also, two patents. Terms easy. Address G. Strong, care H. N. Meyers, 218 Fulton street, New York. 14 & 15

Wanted.—Address of Makers of Toys Steamboats with small working engine.—W. C., Box 104 Mount Vernon, N. Y.

Gould's Bottle Stopper.—The Patentee states that his invention, which was illustrated on page 180, is better adapted for cider, ale, and porter, than for soda or other aerated waters.