AGRICULTURAL INVENTIONS.

A combined harrow, cultivator, and plow has been patented by Mr. Solomon Franklin, of Pine Bluff, Ark. It is made with inclined tubular side bars having cultivator-teeth and connected by arched cross bars with standards carrying adjustable plows, with other novel features, for pulverizing the soil and throwing it to or from the plants, and to regulate the depths to which the teeth and plows enter.

MISCELLANEOUS INVENTIONS.

A gate has been patented by Mr. John G. Wilson, of Cameron, Texas. This invention covers a novel construction and arrangement of parts for a farm gate which can be opened from either side by a person on horseback or in a vehicle, or by a pedestrian.

A type writing machine has been patented by Mr. Edward R. Roe, of Dixon, Ill. A type disk and index circle and indicator are used, but the object of the invention is to simplify the construction and arrange the parts to operate more rapidly.

A hoisting and lowering apparatus has been patented by Mr. Isaac I. Lancaster, of Tacoma, Washington Ter. This invention relates to apparatus for hoisting and lowering objects with a windlass and jack, consisting in a novel arrangement of springs which actuate the pawls in various uses of the machine.

A watch case has been patented by Mr. Victor Nivois, of New York city. This invention consists in setting jewels in the cap plate of the watch case and protecting them with the back plate of the case, the back plate having openings formed in it to reveal the jewels.

The sinking of hydraulic piles forms the subject of a patent issued to Mr. Lowell E. Blake, of El Paso, Texas. This invention covers the use of a jet of water supplied at the entering point of the pile, in connection with a weight at its upper end, for the sinking of wooden or other piles in quicksand, etc.

A step ladder has been patented by Mr. Wright Pearson, of Jamestown, N. Y. It is of novel construction in several important features, and has a hand rail whereby one can steady himself, and so a paint vessel or tool box can be conveniently held to facilitate any kind of overhead work.

A feed rack has been patented by Mr. Benjamin F. Waggoner, of Litchfield, Ill. It is for feeding hay and other fodder to stock, and is so made as to prevent the fodder from being wasted and prevent hogs from having access thereto, while it can be readily moved from place to place.

A music stool has been patented by Mr. George A. Ramseyer, of Dobbs Ferry, N. Y. It is so made as to be used with or without a back, and so that when the back is folded down it does not interfere with the ordinary use of the stool, and the stool may then be packed in small space for shipment.

A fishpond trunk has been patented by Mr. William S. Mallard, of Darien, Ga. It is so devised that the overflow water of a pond may be used to operate a waterwheel, or to pass off without working the wheel, but in either case the escape of the fish from the pond will be prevented.

A clothes line support has been patented by Mr. William C. Young, of Paterson, N. J. The device is to be hung by its roller end on the upper part of the clothes line, keeping the two parts of the line at a uniform distance apart, supporting the lower line from the upper, while the supporters will not run together and against the clothes.

An adjustable mirror bracket has been patented by Mr. John J. Langdon, of South Pueblo, Col. This invention covers a special combination of parts and details whereby a mirror can be easily adjusted higher or lower according to the size of the person, and can be inclined laterally and to the horizontal plane.

A kitchen safe and flour chest has been patented by Mr. William Knowles, of Rockville, Ind. It has two flour chests wtih inclined bottoms and screen, a conveniently arranged dough board, receptacles for seasoning materials, a box for holding bread, all specially arranged to promote convenience in usual kitchen or household use.

A spring armored hose pipe has been patented by Mr. Joseph A. Coultaus, of Brooklyn, N. Y. This invention consists in spiral armor formed of spring steel wire, the internal diameter of the spiral being smaller than the external diameter of the pipe, so the coils form a spiral spring that binds closely at every portion of its length.

A saw swaging device has been patented by Mr. Henry Williamson, of Bay City, Mich. Combined with a box is a device for gripping the saw teeth, and a shaft on which a die is formed for swaging the teeth, the device being simple in construction, strong, and durable, and one which can be used on gang or circular saws.

A hacker for chipping pine trees has been patented by Mr. Randolph M. Barron, of Castleberry, Ala. The cutting head is of the usual loop form, but instead of being made all in one piece is of sectional construction, having a separate bit piece to enter within the body part and held adjustably in place, so the tool can be used a long time by just changing the bits.

A shovel fastener for cultivators has been patented by Mr. George W. Lilly, of Center, Mo. The shank of the standard has a longitudinal rib or elongated cog, in combination with a novel construction of fastener with grooves to fit said rib or cog, so the shovel may be adjusted to occupy different positions laterally and also different depths.

A drilling apparatus has been patented by Mr. John Hunter, of Kingston, Ont., Canada. Its construction is such that the tension or friction can be made light enough to run small drills, such as are usually operated by bows, or it can be adapted for heavy work, being calculated for all the ordinary work of watchmakers and jewelers.

A process of uniting gold and vulcanite has been patented by Mr. Jehu H. Wood, of Lebanon, O. It consists essentially in the application of a solution of chloride of silver to the plastic gutta percha or rubber prior to the application of the gold and to the vulcanization of the mass, whereby a union is made between gold and vulcanite.

A chain saw has been patented by Mr. Walter S. Shipe, of Minerva, O. It is composed of single and double links jointed together by shouldered rivets, the links fitted with cutters dovetailed to pass between lugs on the side of the links, the cutters forming cutting and clearing teeth, and the machine being adapted for felling trees and cutting logs.

A support for rock drills has been patented by Mr. George W. Nixon, of Rockwood, Tenn. This invention provides a base against which a drill propelled by a ratchet lever or similar device may push to force itself into the rock, and means whereby the ratchet drill may be quickly readjusted after it has extended to its limit.

A mosquito net frame has been patented by Mr. Thomas A. Watson, of Houston, Texas. Combined with two side posts having pivots are horizontal arms working thereon, a bar connecting the tops of the posts and an extensible bar connecting the arm ends, so the net may be easily swung over a bed or folded back out of the way.

A door opener has been patented by Mr. Charles E. Whitney, of Brooklyn, N. Y. It is made with a slot in the striker to receive a pin on a gear wheel, which is operated by a rack bar and spring, whereby the striker will be locked in place by the pin, and the striker cannot be forced back from the outside while the door opener is easily operated.

An emery and sandpaper machine for dressing leather has been patented by Mr. Frederick H. Meyers, of Philadelphia, Pa. Combined with an abrading wheel is a pivoted lever and devices for moving it toward the wheel, with a cushioned support on the lever, so the leather will give more or less, and not be heated or burned by the wheel.

A trace holder for back bands has been patented by Mr. Alonzo Collins, of Chetopa, Kan. A recessed metal plate is riveted to the lower end of the back band, the plate having apertures, while there is a detachable hook for holding the trace chain, with a shield, a shank, and a catch, the device being adjustable to fit horses of different sizes.

A car axle box has been patented by Mr. Jesse S. Williams, of Beaver Dam, Ky. In combination with the axle is a journal box with a chamber for holding a lubricant, and an interior cap block so fitted as to close the outlet of the chamber and bear on the rotating axle, being opened by the jar of travel to permit the flow of the lubricant to the axle.

A combination lock has been patented by Messrs. Thomas H. Cole, of East Albany, and Charles McCarrick, of Tivoli, N. Y. It has sliding tumblers, any suitable number of which may be used for complicating the lock, which may be of a hasp or other form, and combinations may be made very easily by moving a pin to different positions, enabling a great many changes of combinations to be made.

A thill coupling has been patented by Mr. Alverow McDowell, of Hudson, Ind. Combined with a clip having jaws is a bolt in the jaws, with caps on the ends of the bolt and having angular arms which overlap between the jaws, and are held by a screw passed through them and resting against the thill eye, making a device which is simple and strong and does not rattle.

A self-closing faucet has been patented by Mr. Andrew J. Homan, of New York city. The construction is such that when the valve is open water or other fluid will pass freely, but the fluid pressure will always act on the inside of the closed forward end or head of the valve to close it to its seat when the pressure on the button is relaxed, unless the valve is held open by a pin and cam device.

An automatic tap has been patented by Mr. Adam J. Geyer, Jr., of Rahway, N. J. It has an externally screw-threaded outer shell and a sliding inner shell, with a protecting cap or cover hinged to its head in such position that the cap is adapted to be closed over the tap when the coupling nut and pipe are removed, and a stamp may be so pasted over that the tap cannot be opened without mutilating the stamp.

A safety attachment for horned cattle has been patented by Mr. William P. Simonds, of Competine, Iowa. It consists of levers to be applied to the horns and connected to a nose ring, the levers being centrally fulcrumed upon the horns in such way that any attempt of the animal to use its horns will cause pain, and break the animal of any habit or desire to use its horns.

A cattle guard has been patented by Mr. Leslie T. Hardy, of Houston Mines, Va. This invention relates to a form of guard where rollers are arranged in bearings in the track bed of a railroad, to revolve from contact with the hoof of an animal, and so deter the latter from passing over, these rollers being hollow and having metal pieces to make a sound to frighten the animal.

A fence has been patented by Mr. John W. Read, of West Salem, Ohio. This invention covers improvements on a former patented invention of the same inventor, hangers for the lower rails being combined with the supports or posts and to rails of a fence, with other novel features, whereby the fence will stand firmly in heavy winds, and can be made, set up, and removed quickly.

An ore separator has been patented by Mr. David F. McKim, of Cable City, Montana Ter. This invention covers a novel construction and combination of parts to promote the more convenient adjustment and steadier working of the ore receiving belt, and to provide better regulation of the water supply to the belt, so as to insure the better separation and closer grrading of the ores.

A fire escape has been patented by Mr. Samuel Snyder, of White Sulphur Springs, Montana Ter. Combined with a windlass drum journaled in a frame is a rope secured thereon, a brake pulley formed on the drum, a brake band around the pulley, and a rope secured to the brake band, so the descent can be regulated by the descending person, or by one in the room or in the street.

A boiler tube cutter has been patented by Mr. George M. Odgers, of Elizabeth, N. J. The cutter stock is cylindrical and has a transverse slot to receive the cutter, with a longitudinal aperture and adjusting bar, with other novel features, to facilitate cutting out the tubes of steam boilers and promote simplicity in the construction and convenience in the use of boiler tube cutters.

A check rein holder has been patented by Mr. William D. Taber, of Rockville, R. I. It consists in a frame, a clamping device arranged to clamp the check strap in a space between itself and the frame, and the frame having a side space or slot communicating with the space in which the check strap is clamped, so a horse may be checked higher or lower, or unchecked from a single line from the vehicle.

NEW BOOKS AND PUBLICATIONS.

A SYSTEM OF IRON RAILROAD BRIDGES FOR JAPAN. By J. A. L. Waddell. Published by the Tokio University, Tokio, Japan.

Professor Waddell went to Japan some three years ago as an instructor in the University, and to attend to practical engineering work, but found there was no work in that country for foreign engineers, and he had but seven students in the engineering department. This work on bridge engineering, therefore, which has been printed by the Japanese University, is left as a sort of memorial and professional record of the author's stay in Japan. It is a most elaborate treatise, in two volumes, one being occupied by tables and plates alone, and for a large variety of bridges every detail of construction is set forth with such completeness that the bridge engineer can here find all his plans ready made.

MODERN MOULDING AND PATTERN MAKING. By Joseph P. Mullin. D. Van Nostrand, New York.

To the moulder who wishes to become a pattern maker, or to understand the more difficult work of his own department, so as to make up new and out of the way jobs intelligently, this book cannot fail to be a valuable aid. Too many moulders are only able to do simple classes of work, the same kinds of pieces with very little variation from year to year, never supposing that in learning to do this they have only acquired the rudiments of their trade. This, we are glad to say, is not the general disposition of American mechanics, but there are some who would like to push themselves forward in the more difficult parts of their business who find it no easy task to do so, from the jealousy or indifference of those who might be their teachers. This book treats of foundry work of many difficult kinds, giving practical examples, with the clear illustrations and plain description which one would expect from a workman who has had experience in all the details of the work concerning which he writes.

TOPOGRAPHICAL DRAWING. By Lieut. R. S. Smith, U. S. A., and Charles McMillan, C. E. John Wiley & Sons, New York.

This is a delightfully simple and practical book, and one which had long use, as originally written by Professor Smith, at the West Point Academy; it is now revised by Professor McMillan, of Princeton, and forms a text book admirably adapted to aid a beginner to the attainment of a high grade of excellence in field sketching, platting, plain and colored drawing, and the reducing, enlarging, and copying of maps or plans. Much of the work shown is similar to that done by the United States Coast Survey, and the plates of conventional signs and tints, with the methods given of laying on the latter, as also the numerous illustrations showing the professional usage in representing a wide variety of subjects, make the book one likely to be of lasting value to those doing such work as a profession, as well as the student.

TOPOGRAPHICAL SURVEYING BY MEANS OF THE TRANSIT AND STADIA. By J. B. Johnson. John Wiley & Sons, New York.

This book describes a system of surveying which has grown up in this country within the last twenty years, and which is conceded to be especially well adapted to preliminary work in railroad and canal surveys, drainage basins, reservoir, dam, and bridge work, and for obtaining contours of the ground over extended areas. It is written by a Professor of Civil Engineering in Washington University, but while sufficiently elementary for students, is intended to be of practical use to the engineer in the field.

Received.

EXTERIOR BALLISTICS. By Captain James M. Ingalls, Instructor, U. S. Artillery School, Fort Monroe. Published as the authorized text book of the class.

THE ELEMENTS OF RAILROADING. By Charles Paine. The *Railroad Gazette*, New York.

CHEMICAL PROBLEMS. By Karl Stammer and W. K. Hoskinson. P. Blakiston, Son & Co., Philadelphia.

Wood working machinery forms the subject of a handsome quarto catalogue, profusely illustrated, which has been recently issued by Messrs. Rowley and Hermance, of Williamsport, Pa., describing the great variety of such machines they make.

The Ferracute Machine Company, of Bridgeton, N. J., also send us an illustrated catalogue and price list of their manufacture in presses, dies, can makers' machinery, and other sheet metal tools.

The steam engines and boilers made by Messrs. Wood, Taber & Morse, at Eaton, Madison County, N. Y., are illustrated and described in a catalogue recently issued by that firm.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Information requests on matters of personal rather than general interest, and requests for **Prompt Answers by Letter,** should be accompanied with remittance of $1 to $5, according to the subject, as we cannot be expected to perform such service without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Minerals sent for examination should be distinctly marked or labeled.

(1) H. W. asks: What kind of a lightning rod is the best, and whether a copper rod is better and safer than iron or steel? Also how they should be placed on the building so as to give complete protection to the house? A. A copper rod is about twice as efficient as an iron rod of the same size. Either copper or iron will answer the purpose if large enough and well grounded. Have a good point at each gable and chimney, and connect all of the metal parts of the roof with the rod. Insulators are unnecessary. For a ground connection dig a trench deep enough to reach earth that is always moist. Have the trench lead away from the house. Make it ten feet long, and put in the bottom a layer of coke or metal scraps of any kind. Place the lower end of the rod along the middle of this layer, then cover it with coke or metal scraps, and finally fill in the trench with earth.

(2) E. E. F. asks: 1. How much larger must I make a dynamo than the one in SUPPLEMENT, No. 161, to get 4 lamps, each lamp equal in candle power to an ordinary kerosene lamp? A. The dynamo described in SUPPLEMENT, No. 161, is suited only to small uses. If you desire to make a larger machine, you should make one after the more recent Siemens, Edison, or Weston plan; you will find instructions for making such dynamos in the back numbers of the SUPPLEMENT and in works on dynamo-electric machines and electric lighting. 2. I have fine oilstone which has become glassy from bad oil being used on it. How can I raise the grit so that it will not become so again? A. Soak the oilstone in naphtha or benzine for several days.

(3) J. S. K.—The simplest way to make a strong permanent magnet is to purchase several of the ordinary horseshoe magnets sold at the stores, and bind them together with like poles and contact. Permanent magnets are made by rubbing the hardened steel across the face of an electromagnet or by inclosing the polar extremities in wire helixes, and then sending a current through the helix.

(4) R. R. M.—There is nothing superior to the dipping needle for indicating the presence of iron ores. You can obtain these needles from J. W. Queen & Co., No. 924 Chestnut Street, Philadelphia, Pa. We think that the ores taken directly from the beds would be fully as likely to be magnetic as those formed on beaches.

(5) E. R. asks if there is anything that will fasten ultramarine blue in cotton goods. A. Use albumen or casein.

(6) C. H. V. asks: 1. What oil is used for keeping sodium in? What causes the explosion when in contact with water? A. Naphtha. The explosion is due to the chemical action, shown in the rapid oxidation of the sodium by the oxygen obtained from the decomposition of the water. 2. How can I cool water, milk, etc., to about 40 degrees without ice? A. Use freezing mixtures. See answer to query 4, in SCIENTIFIC AMERICAN of June 21, 1884. 3. How can power be best transmitted 1,000 feet—by wire rope, compressed air, or shafting? A. All things being equal, cable wire is probably the best.

(7) B. F. S. writes: I did not meet with success in taking off ink from common writing paper. I took nitric acid and diluted it with water, but after the ink disappeared I could not write over the same place without it disappearing also. What is deficient or lacking? A. The best substances with which to remove ink spots are a cold aqueous or acetic acid solution of calcium hypochlorite, or else solutions of bleaching powder or eau de javelle. 2. What is the best receipt for a sea foam? A.

Bay rum	2½ pints.
Water	½ "
Glycerine	1 ounce.
Tinct. of cantharides	2 drachms
Carbonate of ammonium	2 "
Borax	½ ounce.

Mix them.

(8) D. R. R.—Rule for length of arc when chord and versed sine are given: Multiply square root of sum of square of chord, and four times square of the versed sine, by ten times square of versed sine; divide this product by sum of fifteen times square of chord and thirty-three times square of versed sine; then add this quotient to twice the chord of half arc, and sum will give length of arc nearly. To obtain twice the chord of half arc, add square root of the sum of square of chord and four times square of versed sine. A great deal of information of this kind is given in Haswell's Engineer's Pocket Book, which we can send you for $4.00.

(9) R. K. asks: 1. Is there a press for ox bones, and how are they prepared for manufacture? A. They are softened by soaking in water in acids, then split and pressed between heated plates, much of the work being then stamped out by cutters. 2. How must tallow be prepared for manufacturing white candles? A. The tallow consists usually of about ⅓ beef and ⅔ mutton suet. For use in warm climates this must be hardened. Among the various methods used for this purpose, the following seems to be the simplest: Use 1 pound of alum for each 5 pounds tallow. Dissolve the alum in water, then put in the tallow and stir until both are melted together, and run into moulds.

(10) Sam asks: What can be used (and how prepared) as an inflator to the toy or silk paper balloons, besides alcohol or kerosene? A. Hydrogen, the lightest of all gases, is readily generated by treating zinc with sulphuric acid. Take a bottle, put the zinc into it, add the acid with water, and the gas will come out through the mouth. Cover the mouth with a cork, and pass a quill or tube through it. To this connect your balloon.

(11) W. H. R. writes: About 30 feet in front of my residence, which is a Queen Anne cottage, runs a telegraph line. From the poles of this line are stretched six wires at a height about level with my roof. The chimney upon my roof extends probably six feet above level of highest wires. Now, do these wires afford any protection to the property from the dangers of lightning? Some say the wires protect it, and some say not. I confess I see no reason why they should, but it is said that no house or barn was ever known to be struck by lightning near a telegraph or railroad line. What is good, full, and exhaustive treatise on lightning protection? A. We think the telegraph wires would tend to protect your house against lightning; but your house should have a system of lightning rods well grounded to furnish the best protection. You will find three books on lightning protection in the Scientific American Book List.

(12) A. W. C. asks: 1. If white is the union of the primary colors, why won't a paint mixture of those colors produce white? A. Because the colors cannot be exactly arranged in the same proportions as those in which they exist in the spectrum, and pigment colors are not pure. 2. Would ½ pound of copperas in a sink be a good disinfectant, and not injure the pipe? A. 1½ pounds copperas to the gallon of water are the proportions recommended by the National Board of Health. It will not injure the pipes. A simpler disinfectant, and one much more convenient, is common salt in similar proportions. 3. Can you furnish a formula for medicinal pancreatine? A. Saccharated pancreatine is prepared as follows: The pancreas is dissected and macerated in water acidulated with hydrochloric acid for about 48 hours, then separated, and the acidulated solution of pancreas passed through a pulp filter until it is perfectly clear. To this clear solution is then added a saturated solution of sodium chloride and allowed to stand until the pancreatine is separated. This is carefully skimmed off and placed upon a muslin filter, and allowed to drain, after which it should be washed with a less concentrated solution of sodium chloride and then put under the press. When all the salt solution has been removed, and the mass is nearly dry, it is rubbed with a quantity of sugar of milk, and dried thoroughly without heat, after which it is diluted until ten grains emulsify two drachms of cod liver oil.

(13) B. asks how to wash flannels to prevent shrinking. A. It is almost impossible to prevent a little shrinkage of flannels in washing, unless the articles are dried on forms. Prepare hot suds beforehand, and agitate the articles in it without rubbing, then squeeze, not wring out, and dry quickly. The patent clothes wringers are an improvement upon hand labor, as without injury to the fabric they squeeze out the water so thoroughly that the article dries in considerably less time than it would do even after the most thorough hand wringing.

(14) R. M. F.—We would not be governed by a phrenological chart in forming our opinion of a young man, neither would we allow the chart to exert any influence in selecting a trade. If the young man does not know his ability and natural inclinations well enough to select a business for himself, we think he should embrace the first promising business opportunity, and do all in his power to succeed, and stick to it until he has sufficiently matured to select to determine to what business he is best adapted by nature and education.

(15) R. L. D. asks: 1. Is Swedes iron as good for electrical purposes as Norway iron? A. Yes. 2. Is No. 12 Bessemer steel fencing wire as good for a three mile line as No. 12 telegraph wire? If not, how does it compare? A. We would prefer the Bessemer steel. 3. Would the dynamo armature be better if made of Swedes iron than if made of ordinary cast iron? A. It depends on the kind of dynamo. If you refer to the small one described in the SUPPLEMENT, cast iron is as good as anything, provided it is very soft. 4. How different would the electro-magnetic machine described in No. 161 SUPPLEMENT be, if it was used to ring a polarized bell on a three mile line? A. The only difference would be that the thimble now forming the commutator should be entire, and connected with one terminal of the armature, and should be pressed by one spring only. The other terminal of the armature should be connected with the shaft, and a spring should bear against the end or side of the shaft. The current will be taken from the springs.

(16) W. S. C. asks how to fill the tube of a mercurial barometer. A. Place the tube in a very slightly inclined position with the closed end lowest, slip a piece of rubber tube over the open end, and pour in the mercury. When the tube is filled, lower the closed end and tap it very gently, to start the bubbles of air upward; finally place the tube vertically with the closed end down and let it remain for a day or so, then put your finger tightly over the open end, invert the tube, and place the open end in the cistern. In the best barometers the mercury is boiled in the bulb to drive out the air and moisture, but the above plan is simpler, safer, and answers very well.

(17) A. W. P. asks: What is used to blacken the graduating lines on boxwood rules? A. Asphaltum varnish is rubbed into the lines, and when perfectly dry is sandpapered off from the surface of the wood, leaving the black in the lines. This is not affected by the shellac varnish which is applied subsequently.

(18) C. H. C. asks the proper way to set a tool to cut threads on a regular taper tap. A. If cutting the threads with a chaser of several threads, the practice is to set the chaser so that all the teeth will cut. If with a single point, the best practice is to set the point so that both sides of the thread shall have the same angle with the center line of the tap.

(19) E. S.—Plaster of Paris is not suitable for moulds for brass. Any fine sand, such as quicksand wet with water containing a little clay, can be made a fair moulding sand. Use as little clay and water as will just make the sand hold together when squeezed in the hand.

(20) W. A. B. asks: 1. What is the best means of keeping a rest pin in piano from jumping, or not holding the string in tune? A. Try wetting it with turpentine. If this does not work, use larger pins. 2. A good cement or glue for fastening on felt, etc., to the action? A. There is nothing better than first class white glue. 3. A preparation for polishing the case? A. You do not state whether your piano case has been varnished and polished. If it has been once finished, you can give it a very good surface by rubbing it with a polish formed of equal parts of rather thick alcoholic shellac varnish and linseed oil, keeping up the rubbing until the desired polish is secured. In view of the skill necessary to use this polish successfully, we advise a trial on something else before applying it to the piano. 4. The reason a piano will not keep in tune, and remedy therefor? A. Either bad construction, unfavorable climate, or bad usage, or all combined. We could not suggest a remedy without knowing the cause. 5. The most scientific method of tuning a piano? A. Consult works on pianos or experts in these matters.

(21) W. C. F. writes: I have an immense pair of elk horns shipped to me from Colorado; they have been exposed to the weather for quite a while, and consequently are bleached quite white. Would like to know if their appearance would be improved by the application of some kind of a brown varnish; if so, what kind? A. Soak the horns for twelve hours in a solution of manganese sulphate, then wash with sodium carbonate, and on allowing to dry the color will change into the brown shade desired.

(22) A. L. P. asks: What is the best way to clean a bottle having contained a fatty substance? A. Alcohol will probably do it. Warm alcohol is better still, and ether or chloroform will dissolve most fats. Coal tar benzol or naphtha can also be used.

(23) J. T. asks how to compound a good indelible ink for marking towels, by means of brush and stencils. A. Printing ink sinks into woven fabrics to a considerable depth, and will last a long time. It is probably the cheapest marking ink that can be used with a stencil. Recipes for indelible stamping inks are given in SCIENTIFIC AMERICAN for December 13, 1884, and also in answer to query 3, in the SCIENTIFIC AMERICAN of November 24, 1884.

(24) P. J. S. asks how the black lacquer is put on opera and field glasses, and what kind of lacquer is it? A. Make a strong solution of nitrate of silver in one dish, and of nitrate of copper in another. Mix the two together, and plunge the brass into it. Now heat the brass evenly till the required degree of dead blackness is obtained.

(25) H. M. Q.—Water always runs down hill, and the Mississippi also runs down hill. The level in all parts of the earth is determined by gravity, and so accepted in all engineering work. The physical center of the earth only coincides with the plumb line on a belt around the earth at the equator, a zonal line in mid-latitude on each hemisphere, and at the poles.

(26) W. H. G. S. desires a good recipe for making pickle to keep beef, tongues, and pork. A. To each gallon of water add 1½ pounds salt, ½ pound sugar, ½ ounce saltpeter, and ½ ounce potash. Let these be boiled together until all the dirt from the sugar rises to the top and is skimmed off. Then throw it into a tub to cool, and when cold pour it over the beef or meat to remain the usual time, say 4 or 5 weeks. The meat must be well covered with pickle, and should not be put down for at least 2 days after killing, during which time it should be slightly sprinkled with saltpeter, which removes all the surface blood, etc., leaving the meat fresh and clean. Some omit boiling the pickle and find it to answer well, though the operation of boiling purifies the pickle by throwing off the dirt always found in salt and sugar.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

September 1, 1885,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Acid, apparatus for the manufacture of sulphuric, J. McNab 325,263
Acid, manufacturing sulphuric, J. McNab 325,262
Air and combustible vapor, apparatus for mixing, G. A. Schoth 325,452
Alarm. See Electric alarm.
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Board. See Bosom board.
Boat. See Collapsible or folding boat.
Boiler. See Steam boiler.
Boiler tube cutter, G. W. Odgers 325,438
Boot or shoe soles and uppers, machine for uniting, S. W. Robinson 325,274
Boot or shoe upper, T. Nally 325,561
Boot or shoe uppers, machine for stretching, A. F. Preston 325,567
Boots or shoes, lasting, W. C. Cross (r) 10,642
Boots or shoes, manufacture of, G. W. Day 325,240
Bosom board, S. J. Lackey 325,346
Box. See Axle box. Cigar box. Fare box. Stop box.
Bracket. See Mirror bracket. Wall bracket.
Bran and other articles, packer for, S. T. Lockwood 325,254
Bridge, swing, M. O. Anthony 325,472
Bridle bit, C. Baker 325,232
Broom sprinkler, T. Andrews 325,375
Brush, tooth, R. S. Lakin 325,250
Buffing roll, F. H. Emerson 325,328
Burner. See Hydrocarbon burner. Oil burner.
Button, H. C. Griggs 325,407
Button, A. G. Mead 325,430
Button fastening machine, C. Erlanger 325,516
Calipers, micrometer, M. M. Barnes 325,233
Can. See Oil can.
Car brakes, apparatus for operating, J. S. Badia 325,474
Car coupling, T. R. Daniel 325,398
Car coupling, A. W. Esleeck 325,518
Car coupling, Esleeck & Eames 325,517
Car coupling, J. W. Neal 325,632
Car coupling, Sparling & Fitch 325,454
Car coupling, J. B. Winters 325,303
Car roof, railway, C. A. Smith 325,634
Cars, device for loading and unloading, Barnhart & Huber 325,309
Cars, loading and unloading, Barnhart & Huber 325,308
Carding machines, stripping mechanism for, J. C. Potter 325,566
Carpet stretcher, L. Krieg 325,345
Carpets, manufacturing filling for rag, E. H. Eisenhart 325,242
Carriage door, P. Weimar 325,580
Carrier. See Cash and parcel carrier.
Cartridge packer and carrier, G. S. Wilson 325,372
Case. See Dental bracket case. Pencil case. Watch case.
Cash and parcel carrier, R. A. McCarty 325,425, 325,426
Cash register and indicator, W. H. Maxwell 325,260
Cattle guard, L. T. Hardy 325,606
Centrifugal separator, A. H. Van Duzee 325,288
Chain, drive, G. S. Briggs 325,494
Chair. See Exercising chair. Opera chair. Reclining chair.
Chart for cutting garments, tailor's, J. S. Olson 325,358
Check hook, E. Kohler 325,613
Churn, D. Conover 325,238
Churn, R. L. Gore 325,530
Churn, J. E. Smith 325,572
Churn, J. B. Sweetland 325,637
Chute, gate, coal bin, etc., automatic screen, B. Kepner 325,343
Cider press, N. Lee 325,252
Cigar box, D. E. Powers 325,627
Clamp. See Soldering clamp.
Cleaner. See Steam boiler cleaner.
Clevis, plow, W. V. Snyder 325,575
Clock cases, japanning wooden, E. Ingraham 325,543
Closet. See Water closet.
Cloth inspecting and trimming machine, J. H. Wilson 325,581
Clothesline support, W. C. Young 325,470
Clutch, friction, M. P. Boss 325,388
Clutching device, Paxson & Croft, Jr 325,565
Coal scuttle, J. Duncan 325,595
Cock, cylinder, G. W. Loomis 325,256
Collapsible or folding boat, J. P. Wright 325,374
Colter, plow, T. C. Sargeant 325,451
Combination lock, Cole & McCarrick 325,321
Cooking apparatus, steam, Haden & Gobble 325,335
Cooler. See Liquid cooler.
Copying process, W. G. Morse 325,353
Cordage and twine making machines, friction device for spools in, B. S. & J. B. Hale 325,336
Corset, M. Gardner 325,600
Cotton compresser, M. T. Brown 325,314
Coupling. See Car coupling. Thill coupling.
Crank for engines, J. L. Bogert 325,489
Cream transportation tank, C. D. Elder (r) 10,643
Creamer, vacuum, N. B. Blackmer 325,482
Cultivator, T. C. Baker 325,477
Cultivator, S. A. Moulton 325,432
Cultivator, grain, A. Lowry 325,549
Cultivators, shovel fastener for, G. W. Lilly 325,421
Curtain fastener, G. P. Bower 325,491
Cut-off, F. Schueler 325,449
Cutter. See Boiler tube cutter. Stalk cutter.
Dental bracket case, J. H. Morrison 325,560
Diamond setting, C. Blancard 325,485
Digger. See Potato digger.
Distilleries, apparatus for mashing grain in, C. S. Corning 325,323
Door opener, C. E. Whitney 325,299
Door, sliding, H. H. Hewitt 325,245
Drier. See Fruit drier.
Drill. See Grain drill.
Drilling apparatus, J. Hunter 325,414
Drilling machines, drill grinding attachment for, E. J. Worcester 325,373
Drum, heating, P. E. Fox 325,405
Dust collector, J. M. Finch 325,521
Dust pan, J. F. Wynkoop 325,304
Easy chair and couch, combined, J. V. H. Ditmars 325,326
Electric alarm, J. J. Wood 325,639
Electric light circuits, socket and connection for, G. Hess 325,540
Electric lights, circuit for arc and incandescent, H. P. Brown 325,389
Electric machine, dynamo, C. L. F. Mueller 325,619
Electric motor, L. G. Woolley 325,641
Electric regulator, W. Stanley, Jr 325,576
Electrical circuits, apparatus for testing, I. H. Farnham 325,520
Electrical conductor, underground, D. Brooks 325,495
Elevator bucket, Banker & Roberts 325,478
Embalming table, C. M. Lukens 325,550
Embalming tables, head rest for, C. M. Lukens 325,551
Engine. See Gas engine. Hot air engine. Steam engine.
Envelope moistener, E. Ryder 325,632
Excavator, C. H. Watson 325,370
Exercising chair, M. G. Farmer 325,519
Exercising machine, W. E. Forest 325,404
Fan, rotary, J. M. Seymour 325,455