

Answers to Correspondents.

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 10¢ a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

TEMPERING MILL PICKS.—F. A. K., in issue of July 15th, asks for a recipe for tempering mill picks. I find the following excellent method: After working the steel carefully, prepare a bath of lead heated to the boiling point, which will be indicated by a slight agitation of the surface. In it place the end of the pick to the depth of 1½ inches until heated to the temperature of the lead, then plunge immediately in clear cold water. The temper will be just right, if the bath is at the temperature required. The principal requisites in making mill picks are: First, get good steel—"Butcher" or "Jessup" I have found good. Second, work it at a low heat; most blacksmiths injure steel by overheating. Third, heat for tempering without direct exposure to the fire. The lead bath acts merely as protection against the heat which is almost always too great to temper well.—R. B., of Tenn.

SCALING STEEL.—L. G. can remove the scale from steel articles by pickling in water with a little sulphuric acid in it, and when the scale is loosened, brushing with sand and a stiff brush.—D. G. P., of Ill.

SOFTENING GUMS.—The trouble with W. W. G.'s gums probably is a deposit of salivary calculus upon his teeth, under the free edge of the gum, which can only be removed by the scaler of a dentist.—D. G. P., of Ill.

PARIS GREEN ON POTATOES.—In your issue of August 19th, C. E. McR. asks if Paris green put on potato plants will poison the tubers so that people would be poisoned by eating them. I think not, and yet cannot consider it entirely safe to use it. Pure Paris green, or Scheele's green, is arsenic of copper. It is insoluble in water; hence, when put upon the soil, it remains in it like so much sand. W. W. Daniels, of the University of Wisconsin, writing on this subject, says, "There is no evidence to show that plants ever take this substance into their circulation, and the laws of vegetable physiology would lead us to believe that if they do so at all it must be in the smallest quantities." Still, to use it to put an active poison into the soil, which may never do any harm. Of course, it is not likely to do any harm from being on the outside of the tubers, for they are usually pared, or at least well washed, before being cooked. But time, only, will show the result of using it, for it will remain in the ground unless removed by those "slow natural solvents which are constantly at work decomposing the mineral ingredients of the soil."—L. Q. B., of Ohio.

BATTERY.—"Neutral" asks some questions which I will endeavor to answer. First: A carbon plate is preferable to a copper one in a theoretical sense, since the battery resistance is less, that is, the intensity is greater with carbon than with copper; but to T. G. B., wishing to construct his own battery, I recommend copper and zinc, because I believe that, in most places, copper plates are more readily obtained than good carbon ones; besides there are practical objections to carbon plates which are difficult to overcome. Carbon is permeable by liquids; and the fluids of the battery, being drawn up by capillary attraction, finally reach the metallic caps and corrode them, thus offering a great, if not an insurmountable barrier to the current. The only means of preventing this is to thoroughly cleanse the plates and their metallic caps after use, or to make the carbons reach so far above the cells that capillary attraction will not raise the fluids to their tops. The first of these methods is troublesome, the second inconvenient, and it thus usually happens that carbon plates are dearer in the long run than platinum ones. Second: I know nothing about "electroplating," having never even seen it; nor do I understand why people should buy "battery fluids" when they can get all the water, acid, and salts necessary. Third: The bichromate solution gives off no fumes when in action, unless too much sulphuric acid be added, when a little hydrogen is eliminated. It may consequently be used in a parlor with impunity.—NEMO, of Canada.

CONE PULLEYS.—Although the subject of what are termed "Cone Pulleys" has been somewhat ventilated in the SCIENTIFIC AMERICAN, and various correspondents have forwarded, from time to time answers to some proposed questions, it does not appear from the communication of A. W. G. that the subject is yet clear in his mind. If A. W. G. has tried the rules given by previous correspondents and found them incorrect, or in some cases worthless, I do not wonder at it. An answer to his question, even if he had given all the data, requires the solution of a transcendental equation, and cannot possibly be solved by diagrams, while, as it now stands, it is mathematically indeterminate. The truth is, that the theory of cone pulleys is a complicated and difficult one, an element in the solution of which is the distance between the axes of the pulleys; and it is only when this distance is very great in comparison with the diameter of the larger pulley, or when the two pulleys are of nearly the same size, that the rule commonly given will apply. If belts were made of some inextensible substance, the difficulties of adjustment would require more accurate rules, but fortunately leather straps readily accommodate themselves to slight errors of construction, although not running in such cases with "equal tension."—NEMO, of Canada.

TABLE CUTLERY.—It is possible that the carving knives which trouble R. S. S. H., with their relighting temper were not heated enough to harden them, except on the edge; or that they were dipped when hot, so that only the edge was suddenly cooled. If the blades were cooled between cold plates, the edge and back might be hard and the middle of the blade softer. Then, when the edge wore away, the temper would gradually fall. If the knives, while in his possession, were sharpened on an emery wheel or dry grindstone, the temper might have been extracted by friction heating; and, furthermore, as "constant dropping wears away stone," so a frequent heating to a temperature of 212° may lower the temper of steel by relaxing the rigid cohesion of its particles. In any case here mentioned, the quality of the steel remains uninjured, and its temper can be restored by rehardening. Working hot steel has been my business for 22 years, and I am surprised at the assertions in the paper read at the London Association of Foremen Engineers, entitled "What is Steel?" I take exception to many of its statements. Watching the effects of circumstances upon the temper of steel has been my practice. It is singular how slight a thing may change its nature. R. S. S. H. may be laughed at for his scalding water theory, but he is not much out of the way.—B. F. S., of N. Y.

BELLOWS.—Let L. V. H. take a common wash tub or half barrel; put a keg inside it, with a hole one inch in diameter. Adjust a small bellows in connection with the keg, to be worked by a treadle. A rubber hose will do to convey the air from the keg to the flame. Fasten the keg to the bottom of the tub, and two thirds fill the latter with water. When the bellows is worked, the air cannot pass out of the mouth of the tube as fast as it is forced into the keg, so the air forces the water out of the hole; and the weight of the water forces a steady pressure of air through the tube.—T. E. L., of Ky.

TABLE CUTLERY.—I will answer that scalding water is of far too low a degree of heat to have any effect on the temper, but hot grease (which table cutlery is likely to come in contact with in the hands of servants), might, if it was brought almost to a flaming point. However, all table cutlery is hardened in oil, and the degree of heat that will give the best result on the thinner part of the blade will not harden the back at all. Hardly any knife with anything like a thick back is hardened for more than one third of its width.—R. F., of Ill.

BELTS.—S. G. D., in pressing one end of his "straight faced tightener" to the belt harder than the other, is only illustrating the principle of the "crowning," or "high faced pulley."—E. B. T., of Pa.

WATER FOR AQUARIA.—G. W. G. can use either well or cistern water, for neither will injure gold or native fishes. I have kept mine, first in one, and then transferred them to the other, in order to see if it would injure them, but I could not see any change in them. He need only change the water when it becomes green. Let him have a small cup handy, and when he passes his aquarium take up a cup full and pour it back into the aquarium from a height of eighteen inches—that will help to keep the water pure.—T. E. L., of Ky.

SPONTANEOUS IGNITION.—I suppose it is a well known fact, that a handful of cotton waste, slightly saturated with boiled linseed oil, will spontaneously take fire within two hours. Will some chemist please explain?—S. S. B., of Vt.

Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—**EXTRACTING FIBRIN FROM BLOOD.**—I would ask the many readers of the SCIENTIFIC AMERICAN, how to deprive blood of its fibrin?—S. G. D.

2.—**LOCUST SEED.**—I wish to plant a quantity of white locust seed, to grow posts for fencing purposes, and have been informed that not more than one seed in every pint will sprout, if sowed ordinarily. Will some of your numerous readers inform me through what process, if any, the seed can be taken to make them propagate? I have been informed by one person that they will require roasting. Is it so? If so, how much? Should they be planted in fall, winter, or spring?—V. A. J.

3.—**POLISHING SHELLS.**—I wish to know how to remove the dark crust from ornamental shells, and how to polish the same.—E. A. S. B.

4.—**KILLING FLIES.**—Can any of your readers tell me of anything which, if burnt in a close room, will kill the flies therein? I have tried brimstone with no effect except to increase the animation of the insects.—J. G. D.

5.—**CONCAVE REFLECTORS.**—Permit me, through your "Query" columns, to ask the following questions: What is the cheapest way to make concave reflectors, about sixteen or eighteen inches in diameter, which will condense the rays of the sun at a point about six feet from the reflector, that is, of six feet focus? It is not necessary that they should be perfectly true. How are the glass lamp reflectors made, the kind that are silvered like a looking glass?—R.

6.—**COMPRESSED AIR ENGINE.**—I see it noticed in some papers that there is a slight modification of the steam engine necessary in order to run the same by compressed air. Please state the said modification. I wish to construct and use an engine to run by compressed air.—A. R. C.

7.—**RENOVATING CARPETS.**—What kind of machinery is used for renovating carpets in large establishments in the city?—O. G. M.

8.—**COLORING GOLD.**—Can some of your readers give me the *modus operandi* by which gold is colored so as to make the so called "Etruscan" jewelry?—R. L. K.

9.—**RESTORING GRINDSTONE.**—I have a large, fine grit grindstone, which has become hard and glazed by exposure. Can any of your readers inform me how it can be restored?—J. E. G.

10.—**ANASTATIC PROCESS.**—Will some of the readers of the SCIENTIFIC AMERICAN tell me how to prepare a zinc plate for anastatic printing, and how to make a transfer ink which can be used with a pen?—E. P. W.

11.—**APPLYING SAND TO SURFACE OF IRON.**—How can I make sand (the same as used in the manufacture of the best flint sand paper) adhere to the planed surface of wrought or cast iron? I wish to use it for sand papering wood. And where can I obtain the sand?—M. N. S.

12.—**FORMULA FOR SAFETY VALVE.**—Will any of the readers of the SCIENTIFIC AMERICAN be kind enough to instruct me how to calculate the effective weight of a safety valve lever?—A.

13.—**BRONZING PLASTER CASTS.**—I have two large plaster busts which I wish to bronze in imitation of good French bronze. Will some one give me the method in detail?—J. W. H.

Declined.

Communications upon the following subjects have been received and examined by the Editor, but their publication is respectfully declined:

BEDFORDIAN SYSTEM OF ASTRONOMY.—

CAUSES OF DISEASE.—Z. C. McE.

COLORADO AND NEVADA ORES.—C. W.

GRAVITY AND HEAT.—M. R. L.

OZONE AND ANTOZONE.—C. H. Du P.

PERPETUAL MOTION.—F. J. A.

PROPULSION ON CANALS.—E. O. P.

PSYCHIC FORCE.—J. E. H.—G. W. R.

SEASONING LUMBER BY DRY STEAM.—H. G. B.

THE AEROLITE THEORY.—C. M.

VAIN EGOTISTS.—R.

ANSWERS TO CORRESPONDENTS.—A. D.—B. T.—J. C. C.

QUERIES.—A. D.—A. L. W. Jr.—W. J. H.

Recent American and Foreign Patents.

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

DENTAL DRILL.—Alexander Hartman, of Murfreesborough, Tennessee.—A ratchet is applied in a dental drill as the flexible rod or connection by which the burr-holding mandrel is revolved. A double threaded nut is applied to the holder and the ratchet within a tube to connect the two parts together. The invention is used with some rotating device similar to the file drill movement, or otherwise as may be expedient.

STREET CARRIAGE.—Mr. George S. McHenry, of Kansas city, Missouri, has invented an improvement in the construction of street carriages to adapt them more especially for running upon Nicolson and other smooth pavements, and which will make the carriage as convenient as a street car, while requiring no track. The wheels are made large so as to roll easily and smoothly. The axles are bent twice at right angles near each wheel, so as to bring the horizontal middle part of the axle close to the ground. The body of the carriage is connected with the axles by bolts or other devices to keep it in place. Springs are interposed between the body and the axles, having sufficient strength and elasticity to support the carriage body and cause it to ride easy. The springs are made of steel or other suitable material, and of any suitable form. The lower part of the side walls of the body of the carriage is made double for a sufficient height to form recesses to receive the wheels, so that the latter may be entirely out of the way and almost entirely out of sight, and, at the same time, not lessen the carrying capacity of the carriage.

BALANCING PISTON.—Leonard Finley, of St. Louis, Mo.—This invention relating to steam or air pistons working horizontally; it consists in providing one or more cavities in the face of the piston at the under side, and admitting steam thereto to act between the piston and the cylinder to counteract the weight. The arrangement also facilitates lubrication.

PUMP.—Everard S. Crowell, of Augusta, Maine.—This is an improvement in the class of force pumps provided with two sets of inlet and outlet valves, and two pistons simultaneously reciprocated in the same cylinder and in opposite directions. It consists in the arrangement, with receiving and suction chambers of peculiar construction, of three induction and three suction valves, whereby, it is claimed, water may be constantly drawn into the cylinder and forced out of the same with more uniformity and steadiness, as well as force of flow, than in allied inventions.

STEAM BOILER.—George Keen, of North McGregor, Iowa.—The object of this invention is to increase the steam generating surface of the ordinary flue boiler and to consume the smoke and gaseous products of combustion thereby economizing fuel. It consists in a series of short funnel shaped conducting tubes, which connect the furnace or fire box with a main flue or combustion chamber of the boiler, and in an adjustable damper at the front end of the said main flue, by means of which any required amount of atmospheric air may be admitted to mingle with gaseous products of combustion in the flue, thereby supplying an additional amount of oxygen to such gases and consuming them. It also consists in a general arrangement and combination of parts.

GANG PLOW.—John Blackwood, of Madison Township, Ohio.—This invention furnishes an improved gang plow, so constructed as to plow furrows of uniform width and depth, and which raises the furrow slice without pressing upon the bottom of said furrow, leaving the ground at the bottom of the furrow loose and porous. It consists in the construction and combination of various parts, as set forth in the specification of the inventor.

ATTACHING PLOWS TO TRACTION ENGINES.—William H. Heydrick, of Chestnut Hills, Pa.—The plows are arranged diagonally across the machine. The plow beams are connected with the beam of a triangular drawing frame by plates. These plates are provided with ribs on the under side which are perpendicular to the line of draft. Each plow beam is provided with a hinge plate, grooved so as to correspond with the ribs of the first named plates, and also with a slot. The hinge plates are clamped to the ribbed plates and to the beam by bolts and suitable screw nuts. These bolts are provided with rubber springs placed under the head of the bolt or under the nut. The object of this arrangement of the spring is to allow the hinge plates to escape when the resistance on the oblique walls of the ribs of each plate becomes excessive. When this resistance is greater than the resisting power of the springs in the lengthwise direction of the bolts, the said plates will escape. The tension of these springs may be regulated by screwing up the nuts.

MOLDING MACHINE.—This is the invention of John Demarest, of Mott Haven, New York. The mechanical details of the invention are of such a nature that they cannot be described here. The machine is especially designed to be useful in core casting, in molding pipes, etc. The claims cover the use of triangular gates arranged and operated in a specified manner, and for the purpose set forth, also combinations of various devices, but the most prominent and novel feature is the formation of the core shafts of large cores of an oval form, so as to leave the greater thickness of sand in the line of movement of the sections of the mold, thereby securing uniform compression of the sand when the mold is closed.

CARPET STRETCHER.—S. Elliott, of Sonora, Cal.—This consists of two bars, at the end of one of which is a box into which the other bar slides. One of the bars is provided with claws to seize upon the carpet. Within the box is a pulley block, cord and windlass. The cord passes from the windlass over the pulley and is then attached to the bar in such a way that winding up the cord thrusts the bar out. In use, the claws are made to engage the carpet; the other end of the device is placed against the opposite side of the room, and the windlass being turned, the carpet is stretched; the windlass being held by a ratchet and pawl while the stretched carpet is being tacked down.

DOVETAILING MACHINE.—John B. Ritchey, of Pomeroy, Ohio.—A revolving cutter is mounted in a vertically reciprocating frame, and a table whereon the work is to be presented to the machine, having the boards, to be dovetailed, clamped upon it, has to be moved along past the cutter the distance from center to center of the tenons or mortises, and held while the cutter moves up or down through the board when laid flatwise to do its work; and as the distances between centers vary in different work, it becomes necessary to employ adjustable spacing devices in connection with the table for the purpose. These consist in the adjustable blocks arranged in a slotted bar, and having the wedges between them, by which they are shifted closer together or further apart, as may be required by the work in hand, the said wedges being driven in or drawn back by a plate and adjusting screw, and the upper ends of the blocks engaging a spring pawl or holder, attached to the under side of the table, and springing down over the blocks, so that a projection on it, bearing against the blocks at one side, will regulate or gauge the position of the table. In this example it is proposed to make use of the same instrumentalities, with the following modifications. The blocks are notched on one side, and fit the wedges in them to hold them down.

MEDICAL COMPOUND FOR KIDNEY DISEASES.—Robert Hawkins and Albert Addison Hill, of Beallsville, Pa.—This is a combination of vegetable remedies to form a remedy for gravel and stricture, and it is claimed is used with the best results in diseases of the kidneys, bladder, and liver, reducing inflammation in those organs and acting favorably upon the stomach.

GUN LOCK.—William N. Bennett, of Illiroya, Iowa.—This invention is a new trigger mechanism which can be used like a plain trigger, or set to constitute a hair trigger, as may be desired. It consists in connecting the main trigger by a slotted arm and pin with the discharge lever so that it will swing said lever plainly for an ordinary discharge, or first lock and then suddenly release it for more accurate firing.

COVER FOR THE LENS OF PHOTOGRAPHIC CAMERA.—Oscar W. Noble, of Darlington, Wis., assignor to himself and Luke Agur, of same place.—This invention relates to covers for lenses of photographing apparatus; and consists in the application of hinged caps to photographic cameras for the purpose of covering and uncovering the lenses. An arrangement of an arm, an arbor, ears, cranks, rod, crank, and handle, is employed, whereby the caps are operated through the turning of a crank to immediately and simultaneously open or close the caps when desired.

MACHINE FOR CUTTING CLOTH.—Ephraim B. Wells, of New York city.—An important improvement in textile manufacturing is that of Ephraim B. Wells, of New York city, an improved machine for cutting cloth. In this machine two drums are mounted, respectively, upon horizontal shafts which hang in horizontal frames, pivoted to an upright post of the main frame. The drums are in line with each other, and serve to hold an endless band or belt, made of thin metal, with projecting lancet shaped cutters that are sharpened at one or both edges. The back ends of the frames are connected with each other by a rod, carrying a nut, and a spring or piece of rubber, under the nut. The nut and rod serve to hold the band taut, and the spring gives it the requisite degree of elasticity. A projecting arm carries a grooved wheel, in which the band is guided to prevent swinging. The platform on which the cloth is supported is of circular form, and is surrounded by an annular platform, which is, by wheels, supported on a lower projecting flange of the first named platform, so that it can be turned around. Both platforms are slotted to permit the removal and application of the band. The cloth to be cut is placed upon the first named platform and fed against the continuous cutter in the requisite direction; it then arrives in rear of the cutter, where it is, in part, supported by the ring platform, and can be readily brought in front of the cutter by turning the ring. This avoids to a great extent, the labor of bodily carrying the cloth to the front, such labor being, at times, considerable when the cloth in its several thicknesses weighs one hundred pounds or more. At the sides of the cutter are fastened, to the supporting platform, small metal plates, which have a slight lateral play, being slotted where the fastening pins pass through them. These plates line the slot above mentioned in the platform just in line with the cutter, and yield slightly to the side whenever some cloth is dragged down into the slot by the cutter. They therefore prevent the clogging of the machine.

WATER WHEEL.—J. Bell, of Carrollton, Mo.—This is a vertical wheel, running in a vertical trunk or cylinder. The wheel consists of a shaft running on a suitable step. A spiral web passes down this shaft, the pitch of the web being varied according to the head. At proper intervals along this web, project from the web, buckets, the space underneath the buckets being filled up with wood. The water passes into the upper part of the trunk through inclined chutes and acts upon the buckets to turn the wheel.

WASHING MACHINE.—William Clark, of Prairie Du Chien, Wis.—This machine consists of a cylinder attached to the axle of a one horse cart, to one of the wheels of which is fixed a gear, meshing into a pinion upon a central shaft passing through the cylinder. This shaft actuates an endless wire netting which passes between rollers in the cylinder, and also the rollers, which may be plain or fluted. The clothes are put in so that the wire netting carries up the goods from suds previously put in, to and between the rollers, so that by driving the machine about, the clothes are alternately soaked in suds and squeezed between the rollers till cleansed. Then a plug being drawn out at the bottom of the cylinder the suds are drawn off, and the continued motion of the machine squeezes out the water, and thus wrings the clothes dry.

RANGE SETTING.—Andrew F. Barry, of New York city.—The inventor proposes to have a wide cast metal plate, as high as the wall of the room, with a cornice at the top, an opening at the front for the range, and a register above the range for setting the latter, instead of the heavy and cumbersome brickwork now used. The plate will fit snugly against the wall at the edges and at the back of the cornice, but between the edges and the opening for the range it will swell outward by graceful curves, to the extent that it is desired to inclose the range. The front may be lined or grooved to represent stone or brick, or it may be ornamented in any approved way, and may have eyebolts or staples projecting from it at either or both sides of the range, near the floor, for the attachment of a bracket, for the support of the range boiler. The edges of the opening for the range may be formed in any way to match the walls of the range where they meet, to be lapped and bolted or otherwise for making close joints. It is claimed that these improved range settings may be afforded cheaper than the brickwork, can be much more readily put in, and will be more ornamental.

DRAWING BOARD.—J. B. Franklin, of New York city.—This invention provides drawing boards with concealed metallic stays or braces, whereby they are prevented from warping, and retained smooth when shrinking. The difficulty to be overcome consists chiefly in the necessity of keeping metal away from the surface of the board in order to permit the application of drawing pins. The invention consists in interposing metallic strips or braces between the hardwood edge pieces and the board in the dovetail grooves at the ends of the board, and also in the use, for large boards, of central hardwood cross pieces, lined at the edges with L shaped strips of metal. These pieces are let in to the body of the board, and act to hold the board from warping, as a piece dovetailed into the board would do. The entire board has nothing but wood on both surfaces, and can, therefore be used on either side.

GLOVE FASTENER.—Monroe B. Foote, of Northampton, Mass.—This is a new and improved fastener for gloves, mittens, and the like, applicable also for shoes and other articles. The invention consists in a metal or other disk, with two eccentric grooves or slots extending from opposite points near the periphery to points near the center, in such a way as to draw studs attached to the parts of the glove or other article to be fastened one toward the other, and hold them when turned in one direction, and push them in the opposite direction when turned the other way. The disk is made detachable from one of the studs for opening the parts more widely when relieved of the strain by the turning of it.

BUTTON.—George W. Phillips, of Fresh Pond, New York.—This invention relates to improvements in the construction of buttons for sleeves, bosoms, or other articles of wearing apparel; and consists in a front piece, of porcelain, metal, or other substance, with a shank having one end screw threaded and the other split for attaching to the said front piece of porcelain or other substance by driving into a hole having two opposite sides under cut for spreading and clinching the split shank, the screw threaded end of which is for attaching the disk for the back part of the completed button to it, said disk having a screw threaded socketed shank for screwing on to it.

ANIMAL POKE.—Nicholas Denny, of Saranac, Mich.—The bow of this poke passes around the animal's neck. The journals of the roller work in sockets or holes in the arms of the bow, in such a position as to leave a suitable space for the animal's neck between its upper side and the top or bend of the bow. The tail or bar of the yoke is pivoted to the upper or forward part of the roller. To the bar is attached a curved plate, which is forked or branched to form prongs or prickers, which pass up in an inclined direction through holes in the roller, in such position that, should the animal press the bar against a fence or other object, the prongs or prickers will be forced out against his neck and thus stop him. A spring, one end of which is attached to the roller, and the other or free end of which rests against the inner side of the plate, is made of such strength as to support the bar when raised from the ground and keep its weight from forcing the prongs or prickers out against the animal's neck.

TREMOLLO FOR ORGANS AND MELODEONS.—John R. Lomas, of New Haven, Conn., assignor to B. Shoninger, of same place.—This invention removes the strain from the shaft of the wind wheel, and overcomes the consequent friction and rattling noise produced when such wheel is connected with an oscillating wing or fan which acts as a tremollo for an organ or melodeon. The invention consists in the use of two wings or fans, which are connected with opposite cranks, and therefore vibrated in opposite directions, so that one will balance the other, thus keeping an even strain on the power applied, making it work with ease, without noise, and, it is claimed, producing a perfect tremollo and beautiful effect on the music.

CONSTRUCTION OF DIES FOR FORMING THE LIPS OF AUGER BITS.—Richard N. Watrous, of Elmira, N. Y., assignor to himself and W. W. Kellogg, of same place.—A block of steel suitable for the die required is so shaped at the striking surface as to constitute the die for forming the lip and head of an auger. Into the striking face of the die is bored a hole, preferably of slightly conical form, into which is inserted a steel pintle, of tapering form. At the end of the pintle is formed a pin or projection, which gives form to the inside of the lip or cut of the auger. A hole is bored into the opposite end of the die to permit the removal of the pintle by the insertion of a rod. The advantages of this arrangement are claimed to be manifold. The die and pintle can be tempered separately. The die, having to withstand the blow or pressure, must be very hard in order to be durable, while the pintle must have a spring temper to prevent breaking. Should the projecting pin break, which it is liable to do, a new pintle can be inserted without great cost, while heretofore the entire die would have to be made anew. Both dies of a pair are or may be provided with such removable pintles.

DRINKING FOUNTAINS FOR FOWLS.—John S. Orndorff, of Virginia City, Nevada.—A vessel with a cover, having a concentric series of holes, through which fowls may drink, but which prevents their getting into the water, has water placed therein, and in the center is inverted a vessel with a narrow mouth, previously filled with water. When the water in the first named vessel is exhausted, so that air can pass under the mouth of the inverted vessel, a portion of the water in the latter descends, and thus keeps up the supply.

MOLDBOARD FOR PLOWS.—George Peacock, Selma, Ala.—This invention has for its object to prevent soil from adhering to the moldboards of plows as they are drawn through it, and thus increasing their resistance to the draft animals, and necessitating frequent halts to enable the moldboards to be cleaned off. Supposing the cause of the adhering of soil to moldboards to be the formation of vacua between the earth and the clay by the great pressure of the one upon the other, the inventor has devised a mold board, having a corrugated, grooved, or ribbed exterior surface, and having also orifices made through it for the purpose of preventing the formation of such vacua.

WASHING MACHINE.—John Lawson, Humboldt, Kansas.—This invention relates to a cylindrical tub, supported in a horizontal position upon legs, the upper half of the tub being removable and serving as a cover, and the lower half being lined with a corrugated zinc plate, and a semi-cylindrical rubber, also corrugated, being placed within the tub, supported upon an axis, and vibratory with respect to the corrugated bottom.

BEEFSTEAK MANGLE.—Dr. John Locke, Lewisburg, Pa.—This invention relates to a beefsteak mangle, in which there are two serrated toothed cylinders placed side by side, between which the steak to be mangled is passed, the stays that support said cylinders not coming together at their outer ends, but being at an interval, which is opposite the space between the two cylinders, wide enough to permit part of the steak to pass through when the whole cannot pass between the two cylinders.

TELLURIUM.—Joseph Troll, of Belleville, Ill.—This invention relates to improvements in tellurians, and consists in the arrangement of parts for illustrating the inclination of the earth's axis, for disengaging the lunar globe from the terrestrial, and in the apparatus as a whole, whereby is secured, by simple and inexpensive means, what heretofore required complicated and costly ones. The operation of the parts composing the train results in imparting to the entire daily and monthly train a rotation in a vertical plane about the sun globe; and the obliquity of the moon's orbit is indicated. The axis of the earth globe is jointed, for the purpose of illustrating the inclination of the earth's axis upon the ecliptic, which causes the change of seasons on the earth. The whole daily and monthly trains move about the sun by means of an automatic motor or watchwork or by hand, which better adapts the application for use in both schools and lecture rooms; the axis of the earth is shown inclined; the horizon both fixed and movable; and the lunar globe may be easily thrown out of action when it is desired to illustrate the movement of the earth alone.

FISH HOOK HOLDER.—Levi Arnold, Belchertown, Mass.—This is an improvement in the mode of securing fish hooks to fish lines or holders, and consists in a grooved stem and ring slide, arranged to operate in connection. The line holder is of the form well known and in use. A stem is rigidly attached to the line or line holder. This stem is grooved to receive one or more hooks, and is made tapering or larger in diameter at its outer end than it is where it is joined to the line holder. At the end of the stem the groove or grooves are designed to be sufficiently deep to receive the stem or stems of the fish hooks. A sliding ring is placed on the stem. This ring is put on before the stem is attached to the line holder, its interior diameter being less than that of the outer end of the stem. When the ring is slipped back on to the small portion of the stem, the "flat" of the hook or hooks may be inserted within the ring, and then the ring and the hooks are slipped up until the ring comes in contact with the stem. In this position the "flat" prevents the hook from being withdrawn from the ring. A weight on the hook serves to tighten instead of loosen the slide.

SOLDERING APPARATUS.—Jacob Gulden, Keyport, N. J.—The can to be soldered is secured on a revolving plate, being held thereon by a spring presser foot, which also serves to hold in place the top which is to be soldered. The soldering iron is attached to a box or chamber in which a gas flame constantly maintains the necessary heat. The chamber and its attached soldering iron are held at a short distance from the work by suitable spring mechanism. The can being placed in position, the soldering iron is held down to the work by operating a foot treadle, and solder being placed at the point of contact, the revolving can is at once rapidly and neatly soldered.

BOOT STRETCHER.—J. Hoffman, Belvidere, N. J.—This instrument consists of a sole piece, from the heel of which rises an angular support, through the top of which descends a screw which presses upon the end of a lever having its fulcrum upon the upper surface of the sole piece. The end of the lever opposite the screw carries a metallic piece to stretch the leather when the lever is operated as described. There are two fulcrums upon the sole piece, one nearer the heel than the other, a short lever being put in the latter for stretching the instep. And also various lengths of levers may be used to stretch any particular part of the boot.

ICE ELEVATOR.—John J. Neuman, Middletown, Ohio.—This invention is an improvement in machinery for elevating ice from the water and delivering it to a chute or other conductor. It consists in an endless machine chain arranged on drums having perpendicular projections at suitable distances along it, one at each end of a strong frame, having bottom rails for the blocks of ice to draw up on and side rails to control it, which frame is connected at one end by hinges or hooks and eyes with the end of a chute or other conductor, and the other end is suspended in the water, so that the blocks of ice being floated against the chain will be caught by the projections, raised out of the water by the chain, and delivered to the chute, the chain being worked by suitable gearing applied to the upper drum.

BURIAL CASKETS.—J. Owen Moore, of Albany, N. Y.—This invention has for its object to make burial caskets or coffins which will not inclose or "box up" the corpse as long as the same is to be exposed, but will leave it entirely open to view from all sides, and which can be readily closed to form receptacles in which the corpse can be buried. The invention consists in hinging the sides and one of the ends of the coffin to the bottom of the same, and in hinging the cover to the sides, so that sides, ends, and cover can be let down to about a level with or below the bottom to fully expose the corpse in the latter. The corpse will then appear as lying on a sort of ornamental couch, producing thereby an effect far less gloomy and depressing than when partly boxed up ready for the grave. When the coffin is to be closed the sides and ends are swung up and the cover folded over the sides, suitable catches being used to hold the parts together. The disagreeable process of securing the lid down by means of screws is thus also avoided. One end of the casket may be rigidly affixed to the bottom so that it will remain in an upright position to support the grillion.

FARMER'S BOILER OR CALDRON.—This is a combination of a large kettle or caldrion with a furnace and jacket for heating, so arranged that the caldrion can be easily dumped, when it is desired to remove its contents. The furnace is provided at the upper end with a jacket which directs the heated gases and flame from the firebox up around the kettle, so as to effectively heat its contents. A portion of this jacket is made so that it slides backward out of the way when the kettle is to be dumped. The kettle is hung on trunnions, from which descend arms which engage the sliding part of the jacket when the kettle is turned upon the trunnions, and thus push this portion of the jacket downward and backward out of the way. The kettle is provided with a cover, having a spout and strainer. This is a good practical improvement which adds much to the convenience of such apparatus. George H. Buckley, of Quincy, Ill., is the inventor.

MACHINE FOR POINTING HORSE SHOE NAILS.—Harry A. Willis, of Vergennes, Vt.—An intermittently rotating carrying, holding, and delivering disk, of metal, with notches in the periphery, works on a horizontal axis in front of a set of four hammering dies, under a guard, and behind a guard. This disk is geared with a vertical shaft extending downward, and having a ratchet wheel on the lower end, with which a pawl works to impart one movement to the disk for each revolution of the driving shaft by which the pawl is worked through the medium of a lever and tappet. The nails, being previously roughly shaped, are put in the notches under one guard, and pointing to ward the hammers by hand, or any competent feeding mechanism; so that the heads will pass in front of the other guard, by which guards they are so confined in the notches as to be readily carried to the hammers and held for being acted on by them. The hammers are operated by a tappet wheel, whereon the tappets are so arranged that the hammers will be at rest, both when the nail is being carried to the position for being acted on by them, and when being carried away. After being hammered on the sides and edges, the nails are carried down and delivered into slots in a horizontally and intermittently revolving disk on the vertical shaft, working over another fixed disk, said slots being suitably shaped to receive the heads of the nails at the inner ends, while the points project beyond the disk as much or a little more than the distance from the point it is required to hammer them. These slots are arranged relatively to the notches of the previous disks, and the two disks are so geared together that a slot will always be ready to receive a nail from the first disk as soon as the nail passes beyond the guards and falls out. This disk, working intermittently, carries the nails first over an anvil, where they are hammered by a die, and then over a pointing die, through which they are forced by a punch, by which and the said die, the edges are trimmed off, and the nails are then discharged.

MACHINE FOR THE MANUFACTURE OF SOLDER, PRINTERS' LEADS, ETC.—Reuben Painter, Baltimore, Md.—This invention relates to a machine in which metals for the manufacture of solders, printers' leads, etc., are melted and stirred together while melting, and are drawn off from the melting pot through a tube having an adjustable feed apparatus, from which the compound is drawn off into circumferential grooves in a revolving wheel, within which grooves the compound is pressed by a flanged roller above, and also cooled by means of cold water introduced within an annular closed box cast in the rim of the wheel next to the grooves therein, the compound being sent out of the grooves by means of spring scrapers fitting in the latter, and passed through a cutting apparatus, wherein it is divided into pieces of suitable length, being then a marketable commodity.

WOODEN PAVEMENT.—James F. Cyles, Chicago, Ill.—This invention relates to a pavement whose foundation consists of boards or planks laid at intervals of an inch, more or less, crosswise of the street upon the ordinary sand bed, and whose rows of blocks are also laid crosswise of the street upon the board foundation directly above the intervals thereof, each row of blocks being furnished with a longitudinal rib, running centrally of one side and armed with projecting nails which extend into the recess side of the next row of blocks, when the latter are driven up against the aforesaid rib by which construction there are created two longitudinal spaces between every two adjacent rows of blocks, of which spaces the upper is to be filled with a novel concrete of Mr. Cyles' invention, and the lower is to be left open for drainage into the gutters at the sides of the streets.

ELECTRIC INSTRUMENT.—L. L. Brecken, of Brooklyn, N. Y.—This instrument may either be used as a toy for children or as a sounding instrument for telegraphing. By a suitable arrangement of parts, an armature may be caused to vibrate without interruption when the proper cups are attached to the battery. By another mode of connecting the wires, however, the armature may be made to vibrate or strike at the desired intervals for transmitting messages. An arm carrying a lamina projects upward from the armature, which striking against a sonorous body of any suitable character, gives the required sound. The armature tilts on its point of contact with the surface of the magnet, and has no lateral pivot as heretofore used. The friction of the pivots is thus avoided, the magnet moving on a spring support and moving easily on account of the flexibility of the spring.

BLOWER FOR CHIMNEY STACK.—Nathaniel L. Blanchard, of Spuyten Duyvil, New York.—The shaft of a fan blower is supported by the chimney or casing, and is placed one side of the center, or in a position where the wings just clear the cylinder on one side, and leave a broad opening on the other side. As the wings revolve, there is a constantly increasing current of the smoke and gases, the strength of which depends on the velocity with which the blower is revolved. The blower is driven by a belt from any convenient portion of the revolving machinery. The inventor states that his experience has taught him that it is more advantageous to draw the smoke and gases from the fire box through the boiler flues than to force or push them, as is usually done; and that the simple fan blower, when properly arranged, answers the purpose admirably.

ICE PICK.—William T. Eames, of New York city, assignor to Leonard J. Haas, of same place.—This is an instrument for picking and breaking ice. It consists in a breaking and picking instrument composed of a hammer head with a steel point or pick at one end, and a handle with a socket containing a pointed steel instrument for driving into the ice by the hammer. This pointed instrument is adapted to be held in the hand, for driving into the ice by the hammer in such parts as cannot be reached by the pick, for instance, a piece of ice being dropped into the mouth of a pitcher, and having projections low down in the contracted part of the vessel requiring to be chipped off to admit the piece, and that cannot be reached by the point, may have them chipped off by the pointed instrument driven by the hammer. It is also desirable to employ the instrument in any case, as it will not cause small pieces to fly off as much as the pick, which cannot be guarded with sufficient accuracy, at each blow, to prevent chipping of the wall of the hole formerly made. As the tool is intended for use on the table, these considerations are important, and make the instrument more desirable than those having only the pick point.

BELLOWS.—Alfred F. Jones, New York city.—The object of this invention is to obtain an air and watertight top and bottom for bellows or similar instruments, and airtight joints at their edges. For this purpose the inner face and edge of the wooden top and bottom are lined with sheet metal, and form a projecting metallic flange at the edge. The metal lining effectually closes the pores of the wood, making it water and airtight, while the projecting flange admits of such an attachment of the flexible sides that an airtight joint will be produced.

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- 118,422.—SPINDLE, ETC.—C. L. Austin, Lawrence, Mass.
- 118,423.—PAPER CUTTER.—W. G. Ayres, S. L. Cole, Brooklyn, N. Y.
- 118,424.—BEDSTEAD.—E. T. Barlow, San Francisco, Cal.
- 118,425.—FURNITURE.—B. B. Blackwell, Jamaica, N. Y.
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- 118,427.—BLEACHING.—H. B. Bond, Terrebonne, La.
- 118,428.—RETAINER.—W. D. Brewer, Charlestown, Mass.
- 118,429.—SPIKE MACHINE.—F. Brusio, Buffalo, N. Y.
- 118,430.—RAKE.—J. V. Bryson, Greensburg, Ky.
- 118,431.—CLOTHES WRINGER.—P. H. Capron, Hudson, N. Y.
- 118,432.—HEATER.—E. Caulfield, Oswego, N. Y.
- 118,433.—BRACKET.—J. E. Chesley, Boston, Mass.
- 118,434.—PEN CASE, ETC.—J. M. Clark, Jersey City, N. J.
- 118,435.—DOLL.—G. P. Clarke, New York city.
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- 118,438.—BARREL, ETC.—J. B. Davenport, New York city.
- 118,439.—PRINTER'S RULE.—A. J. H. Duganne, New York city.
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- 118,441.—TOY.—J. Fallows, Philadelphia, Pa.
- 118,442.—BOILER.—B. T. Fellows, Lancaster, Pa.
- 118,443.—BRAKE.—A. W. Filer, L. T. Hatfield, Danby, Ill.
- 118,444.—BOOT.—C. S. Foster, Ashland, and O. Saylor, Phil., Pa.
- 118,445.—MUSICAL INSTRUMENT.—J. Foster, Keene, N. H.
- 118,446.—LOOM.—H. R. Fry, Wabash, Ind.
- 118,447.—HOIST.—E. R. Gard, Chicago, Ill.
- 118,448.—SAWING MACHINE.—L. W. Green, Williamsport, Pa.
- 118,449.—GROOMING HORSES.—J. J. Greenough, Syracuse, N. Y.
- 118,450.—SEWING MACHINE.—W. O. Grover, Boston, Mass.
- 118,451.—STAND.—E. A. Harris, Chicago, Ill.
- 118,452.—SEAT.—B. Hershey, Erie, Pa.
- 118,453.—BOX OPENER, ETC.—G. J. Hill, Buffalo, N. Y.
- 118,454.—WINDOW BLIND.—I. H. Hobbs, Philadelphia, Pa.
- 118,455.—ROTARY PUMP.—C. E. Hutson, St. Louis, Mo.
- 118,456.—WATCH KEY, ETC.—J. Jenner, Chicopee Falls, Mass.