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 $1.00 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 an 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 arsenite 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 is 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 recommended 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 "electropoin," 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, one 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 relenting 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 fail. 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. R. 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 hight 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. Mc E.
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 rattan 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 rattan within a tube to connect the two parts together. The invention is used with some rotating device similar to the fiddle 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 hight 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 eduction chambers of peculiar construction, of three induction and three eduction 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. 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. Eliott, 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 gage 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 Illyria, 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 tense, 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 be 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.