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.

S. F. M., of Ill.—You can make a magic lantern with two fine sets of photographic portrait lenses that will give good sized images.

R. L. K., of ——.—You should be able to get such a spring as you require made in any good machine shop.

W. H. B., of Va.—Your suggestion in regard to tramways is not new.

J. E. B., of O.—The metallic specimen you sent is pure galena, a valuable ore of lead. The other two are barytes, extensively used for white paint.

PURIFYING KEROSENE OIL.—N. L. & Co. can recover kerosene, after using it to remove whale oil and grease, by distillation at a low temperature—say 130° to 150° Fahr. Probably the contaminated kerosene, if in considerable quantity, can be sold to the refiners.—H. G. F., of Va.

CONDENSATION ON WINDOWS.—Let J. E. G. double the glass in his show window, leaving a space of one fourth of an inch between each pair of lights. If he wishes to test the above, he can try it on one light or section of his window.—C. H. B.

DISCOLORATION OF BRICKS BY SMOKE.—Whitewash with sifted wood ashes; a double handful to the pailful will do the thing nicely. The ashes form a lye that acts upon the soot. A coloring matter can be added if desirable, or the wall might be gone over by a man whose trade is called tucking.—C. H. B.

WEAR OF SLIDE VALVES.—If a valve's diameter is five inches and it moves two inches, there is a space of three inches in the center, say over the ports, always covered, and of course always under wear; while there is one inch, at either end of the stroke, that is under wear just half the time. If W. C. would overcome this, he must adopt a cylindrical oscillating valve, which, properly constructed, wears tight.—R. H. A., of ——.

PUMPING WATER A LONG DISTANCE.—I would inform M. H. P., through your columns, that he can pump water the distance and rise he speaks of, and even further. I can show him a pump that draws the water 280 feet horizontally and 27 feet perpendicularly. It has been in use four or five years, pumping water for a farm yard, and has had no repairs until this season.—E. A. P., of Vt.

CEMENT FOR AMBER.—J. R. (query 13, November 18) can cement or mend amber by smearing the surface of the pieces with linseed or boiled oil, and then strongly pressing them together, at the same time holding them over a charcoal fire or heating them in any other way in which they will not be exposed to injury.—C. E. B., of N. Y.

CANKER IN MOUTH.—I would say, in reply to F. S. C., let him take one ounce of muriated tincture of iron, and add four ounces of water, and rinse his mouth frequently with it. He will have no more canker.—G. H. J., of N. H.

CANKER IN MOUTH.—In answer to query No. 7, November 18, I would say to F. S. C. that local application will afford but temporary relief in cases of obstinate sore mouth. If his trouble has been caused by the excessive use of bad chewing tobacco, or by the adhesion of tartar on his teeth, let him remove the cause, and then gargle with a strong solution of white copperas (sulphate of zinc), using great care not to swallow any of the gargle, as it is a violent poison when taken into the stomach.—A. B.

CANKER IN MOUTH.—If F. C. S. will follow this advice (and I suppose he will not) he will doubtless get rid of the canker, if he means, by that, sore spots about the tongue and mouth. These ulcers, simply symptoms of irritation of the stomach, cannot be cured but by removing the cause. Keep yourself a little hungry, eat no swine's flesh, keep your bowels persistently free by opening diet, do not drink whisky, and you will soon rejoice in a sound mucous membrane.—R. H. A., of ——.

AMALGAMATING ZINCS FOR BATTERY.—Lay the zincs upon some flat surface or an earthenware plate, and wet them with dilated sulpuric acid, say acid one part to water twelve parts. Then pour on some mercury and rub it on with the finger. If the mercury rolls up in little round balls, add a few more drops of the acid solution. If S. H. intends to use the solution of sulphuric acid for his exciting fluid, the above will be the proportions of water to acid.—J. F. of Ga.

WORKS ON METALLURGY.—S. H. will find the "Manual of Electrometallurgy," by Napier, and "Elements of Electrometallurgy," by Smee, probably the best works on the above subject. The first named volume contains all he will require to know.—J. F., of Ga.

COLORING GOLD.—To obtain the red color of fourteen carat gold in plating, prepare a solution of cyanide of gold and cyanide of copper, add the cyanide of copper to the gold solution, until the desired color is obtained. Mode of application: use gold of the desired color. The cyanide of copper is prepared by adding cyanide of potassium to a solution of sulphate of copper until the precipitate at first thrown down is redissolved.—J. S. G. S.

MATERIALS FOR FILTER.—R. B. M. wishes to know the best form of filter. I know of nothing better than soft bricks. They will necessarily be put in the form of a partition, laid in cement, so that the water cannot get between them, and allowing the water to pass through the thin way of the brick. This may color the water a little the first time the filter is filled, but after being pumped out, it will be perfectly clear the next time, if the shingles do not color it.—S., of Mass.

BLACK COLOR ON BRASS WORK.—I take pleasure in complying with C. D.'s request. Make a strong solution of nitrate of silver in one dish and of nitrate of copper in another. Mix the two together, and plunge in the brass. Now heat the brass evenly till the required degree of dead blackness is obtained. This is the method of producing the beautiful dead black, so much admired in optical instruments, and which was so long kept a secret by the French.—L. S.

CASE HARDENING.—In answer to E. N, G., I would say that I have used two kinds of case hardening to good advantage. These two kinds I will term the quick and slow processes. The first is done by heating the article you wish to harden to a red heat, and rolling it in or sprinkling it with prussiate of potash; then return it to the fire and heat to a light red, then plunge it in water. The next or slow method is done by burning scraps of leather to coal and pounding fine; then putting the ash n a sheet iron box in layers with the article which is to be hardened. Begin and end with the coal; place the box and contents in a sharp fire for an hour or an hour and a half; then dump the contents of the box into water. This hardening is used by many gunsmiths to produce the colors often seen on iron gun mountings. It may be polished, if desired.—J. H. H., of Mich.

AMALGAMATION OF ZINC PLATES.—Let S. H. immerse his zinc in sulphuric acid diluted by water to about two thirds its former strength, and let it remain until the dirt is removed, and then immerse in mercury. If the amalgamation is not perfect or nearly so, repeat the process; but if it is not perfect, it will make no] pereeptible difference in the or in of the battery.—G. A. F.

BLACK FINISH ON BRASS INSTRUMENTS.—In answer to query in SCIENTIFIC AMERICAN of November 18th for process of blacking brass work, as done on optical instruments, let C. D. procure a spirit lamp or gas jet with large flame and a brass plate, also some nitric acid (not too strong, but strong enough to fume briskly) in which let him dissolve silver and copper in the proportion of a piece of each about the size of a grain of wheat to a quart of acid. If he has much work to blacken, he should have enough acid to dip his work into, after which it should be allowed to drain a minute. It will then be of a rough green color. Then, having the brass plate heating over the lamp, let him lay the article on it; if the plate be hot enough, his work will turn of a dingy, rough, scaly looking black in about fifteen minutes. Then let him take it off and let it get cold. Lastly, rub the surface and polish with a little olive or other oil and a piece of soft leather. If only a few articles are to be blacked, use less acid, and rub it on with a cloth tied on the end of a stick.—D. L. B., of Pa.

HEATING SMALL STEEL ARTICLES.—Let P. L. S. place a black lead or common cast iron crucible (capable of containing two or four quarts) filled with lead, on a fire made of charcoal. The crucible should rest upon bars of iron just above the blast. Place a wall of brick around the crucible, leaving sufficient space between the wall and crucible (say six or eight inches) to fill to the top of the crucible with charcoal. By leaving draft holes in the brick wall at the bottom below the grate (made of the iron bars) on two or three sides, there will be sufficient draft to keep the lead hot. Place the shank of the knife blade in the tongs, at right angles with the jaws, and let the tongs rest on the top of the crucible, while the knife blade is submerged in the heated lead. Have two pair of tongs, and put in a cold blade before taking out the hot one to work. Grease the blade with some cheap grease which will prevent the lead adhering to the article. By having two or three pairs of tongs, the articles will heat as fast as they can be hardened. I have used the process for years when in the cutlery business in New England.—S. A. W. of Iowa.

PUMPING WATER FROM LONG DISTANCES.—M. W. Q., of Mo., is mistaken in saying that "ten feet horizontal is equal to one foot perpendicular." The distance horizontally from which water is brought to a suction pump is of small consequence, if only the pipe be large enough to reduce the friction to a minimum; because friction is the only obstacle to the conveyance of water to any distance horizontally, if only the air be exhausted from one end of the pipe. All suction pumps that draw the water for a considerable distance horizontally or vertically should have a vacuum vessel. At every stroke of the piston, the entire column of water, of whatever hight or length, is put into rapid motion, and if there be no vacuum vessel, the motion of the column is suddenly checked at the end of the stroke, and a great effort is required at the commencement of it to set the column into motion again. A vacuum vessel, which should be of ample capacity, will prevent all shock by the column at the end of the stroke, and all jerk at the beginning of it. I have now four pumps with vacuum vessels, driven by steam, all of them drawing fluids horizontally with great ease, without jerk or shock. The vacuum vessels, in my case, are simply pieces of gas pipe, two inches in diameter and four feet long, joined with the suction pipe just under the pump by an inch and a quarter connection. One pump, with leaden pipe, has a piece of leaden one and a half inch pipe, five feet long, soldered to the suction in the same position. The action is perfect. The longer the distance horizontally, the larger the suction pipe must be to avoid friction.—N. D., of Me.

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.—RESISTANCE OF BRASS TO PRESSURE.—How much internal steam pressure per square inch will a cylinder, nine inches in diameter, thirteen inches long, made of twenty-four gage sheet brass, stand?—J. S.

2.—POCKET ELECTRIC BATTERY.—Will some electrician inform me if I can make a battery small enough to be carried in a coat pocket, and powerful enough to give an electric light? A mere spark is all that is wanted. What is the best form of battery?—J. S.

3.—TANNATE OF SODA.—In the SCIENTIFIC AMERICAN of October 28th, there is an article on boiler incrustation. Dr. J. G. Rogers recommends, as a preventive, tannate of soda; will he, or some one else, inform me what quantity to use, say for a 40 horse boiler using 100 barrels water per day?—E. F.

4.—GRAPE JUICE.—Having a quantity of grape juice, in casks, which is now fermenting, I would like to know how to make it into good wine.—M. T. M.

5.—FITTING MOLDING.—Can any of the readers of the SCIENTIFIC AMERICAN give me a rule for fitting rake and crown molding, or cornice, that will work to better advantage than sawing it up, which is seldom an easy job, when the jet is wide and the staging is narrow, as is often the case at the corners when jacks are used for a staging?—S.

6.—BEES IN WINTER.—Will bees smother in their hives if they happen to get covered up with snow all winter? My bees are near a fence, on the summer stand, twenty inches from the ground, and the hives ventilated from bottom only. How much honey will a stock consume in a winter?—J. E. R.

7.—SOFTENING OIL STONES.—Is there any process that will have a tendency to soften an oil stone? I am a mechanic and have a great deal of trouble in getting a good oil stone, they all being too hard.—C. R.

8.—GLUE FOR JEWELLERS.—I would like to know the best glue to use at a watch maker's and jeweller's bench, for general purposes in that line of business. Also the best method of tempering lifting springs for watch cases.—R. K.

9.—CEMENT FOR MENDING CHINA, GLASS, ETC.—Can any of your correspondents give me a recipe for making a cement for mending china, glass, etc., which will set quickly, and stand hot and cold water? I have tried every thing *for sale* and have made quantities of cement from book receipts, but the result is the same. Can a cement be made with soluble glass?—G. H. J.

10.—PRESERVATION OF BELTING.—Where can I get the best information in regard to the use, treatment, and care of belting, especially leather belting? I am troubled with the rapid wearing out of belts running at high velocity.—W. L.

11.—ENAMELING CAST IRON.—Will some one please give us, through your paper, a practical receipt for enameling cast iron, with such enamel as is put on kettles?—W., BROTHERS.

Declined.

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

DISCOVERY IN HOROLOGY.—J. M.
FIREPROOF BUILDINGS.—J. R. M.
INCOMBUSTIBLE LUMBER.—E. C.
PERPETUAL MOTION.—A. J. R.
PSYCHIC FORCE.—A. M. L.—J. M. D.
STANDARD TIME.—F. A. S.
WAVE POWER.—U. S.
ANSWERS TO CORRESPONDENTS.—C. H. K.—G. H. S.—J. G. H. J. R. J.—J. S. G. S.—M. D. C.—T. L. V. D.—W. J. W.
QUERIES.—C. & H.—C. S. & J. M.—G. W.—I.—S. B. A.

Recent American and Foreign Patents.

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

HAY TEDDER.—John K. Collins, of Hartford, Vt.—This invention relates to a new manner of hanging the forks of a hay tedder, and is an improvement upon a patent granted to the same inventor, October 12, 1869. The axle or cross beam of the hay tedder is supported by wheels and made part of a frame, in which are the bearings of a crank shaft, operating the forks. Rotary motion is transmitted from one or both of the wheels to the crank shaft by a gearing chain or other means. The cranks of the shaft pass through journals affixed to the lower parts of rods, the upper ends of which are slotted and connected with a pin, in the forked ends of levers, hinged to the axle or other part of the frame. From the front ends of the levers are suspended, by a pin, the shanks of the fork. The lower part of each shank passes through a tubular guide. The crank in revolving causes the rod to vibrate on the pin, and to impart, by means of the connection, the same motion to the fork. The fork is made self-adjusting to the formation of, and made to drop in actual contact with, the ground, to be most effective in operation. To the lower end of each shank is secured a ferrule, which carries at its lower end a transverse tube. Through this tube is fitted a short rod, around the ends of which wires, constituting the tines of the fork, are wound. The upper ends of these wires are secured in small tubular sockets that project from the sides of the ferrule.

WALKING PLANTER.—Nathan Earlywine, of Centerville, Iowa, assignor to himself and Charles A. Davis, of St. Louis, Mo.—This is a machine for seeding, distribution of fertilizers, etc., for corn, cotton, and other crops. The seed or fertilizer may be dropped in a continuous drill, or intermittently as desired for crops grown on hills like corn. The machine is light and graceful in design, and seems a good and efficient one.

SPARK ARRESTER FOR STEAM BOILER.—John Gates, Portland, Oregon.—This invention consists in an improved spark arrester for steam boilers, in which the inventor takes advantage of the angle or turn which the air and smoke makes from the horizontal tubes to the perpendicular smoke stack. The greater velocity of the coals, owing to their greater weight, carries them past the lower entrance of the smoke stack to where there is an eddy, or at least insufficient draft to lift them, so that they will fall to the bottom of the smoke box. At this bottom there is a water well. On boats the same may be produced by cutting an opening or slot through the bottom of the boat, so that the coal, etc., will fall directly into the water that carries the boat. The water well may also be provided with two sets of inclined apertures or pipes, through one of which the water enters, while it escapes through the other during the movement of the boat. A constant current of water passes thus through the well, carrying off the coal and sparks. The well may, if desired, be of other construction, so as not to be connected with the bottom of the boat. It may, for stationary boilers or on locomotives, be only a plain water vessel. A wire or perforated screen is set in the smoke box at some distance from the tubes, so that the sparks are thrown under the screen, and are thereby kept from ascending the smoke stack. By this invention, it is claimed, the coals are arrested without making the smoke stack heavy; as the screen is set in the smoke box, with the exhaust above, less volume of vapor is carried through the screen than would be if it were on top, and it is also, therefore, less liable to foul. The coals, when once dropped, never rise again as in other spark arresters, where they dance against the screen until broken fine enough to pass through. The well furnishes good opportunities for getting rid of the blow off pipes and deadening the noise usually made by them.

PERMUTATION LOCK.—Samuel C. Weddington, Jonesborough, Ind.—Each tumbler is provided with a circle of holes with changeable pins, and a groove around its periphery. Each groove has a wire attached at one end to the case of the lock, and by the other end to an adjustable nut block on a screw. These tumblers are kept in their proper positions by the tension of wires, and the tension is increased or diminished by adjusting the nut on the screw. Changes in the combination are made by changing the positions of one or more of the pins in the holes of the tumblers. By an arm on the spindle of the knob, the tumblers are turned and the bolt operated. A recess in the bed tumbler receives the arm and gives it a hold on the tumbler. This tumbler is of irregular form, one end reaching to near the edge of the case, to which is attached a rod, the other end of which is attached to a bolt. The bolt is actuated by means of this rod, as the tumbler is turned by means of the arm on the spindle. Each of the tumblers above the bed tumbler is provided with a slot, which admits the stem of a bolt when the tumblers are properly arranged. The shifting tumbler has a recess in its under side, which receives the spindle arm as the knob is pressed in, by which means the shifting tumbler and the other tumblers are turned and adjusted to the proper position for receiving the stem of the bolt. The edge of the shifting tumbler is cut into a succession of arcs of circles corresponding in number with the holes in the tumblers, and is kept in position, and the changes are indicated, by means of a pulley which revolves in the end of a spring lever. In moving or adjusting the tumblers, the arm on the spindle will be in the recess in the shifting tumbler, and the tumblers are put in position by turning the knob, the shifting tumbler serving as a dial, a single mark only for a starting point being necessary. As the shifting tumbler is turned, a click will be heard as the pulley on the spring lever passes from off one arc to another, or the friction will indicate its passage, an account of which is kept. The combination being known, the number of arcs indicates the position of the tumbler, and brings the slots in all the tumblers to one position. When this is done the knob is slightly drawn back, so that the arm on the spindle engages with the recess in the bed tumbler: then, by turning the knob, the bolt is drawn back and the door is unlocked.

SAW SET.—This is an improvement upon an invention patented by the same inventor, Erastus Y. Clark, of New York city, April 19, 1870, and which is calculated to supply certain defects and perfect the original device. The present invention consists in applying to the saw set a supporting slide for sustaining the saw as it moves across the apron and anvil during the process of setting, by which the narrowest saw may be securely held and guided over the anvil to bring the teeth properly under the action of the punch.

SEED PLANTER.—Judging from the activity in this class of improvements, the demand for them must be very large, and almost any invention of the kind that can hold its own with those already in market, or better still, make decided advances on the devices already introduced, is, it would seem, sure of sale. The invention under notice is, like most others of its kind, a combination of movements designed to perform all that others have done, and to supply their deficiencies. The combination is essentially simple, and is, we judge, well calculated to secure approval from agriculturists, providing all necessary adjustments to adapt to different kinds of work. Patented by Ezra E. Chesney, of Bushnell, Ill.

COMBINED SEEDER AND CULTIVATOR.—This invention consists in an improved frame on wheels adapted to receive either a cultivating, planting, or a seed dropping device. The invention provides for side variation to prevent tearing up rows in cultivating corn, furnishes a convenient seat for the driver, and places the operation entirely within his control, provides for turning at the ends of rows or the passage of stones, stumps, etc.; for regulating the depth of drills, and supplies adjustments for adapting the machine to sowing in drills or broadcast, regulates the proportion of seed to the area to be sown, and in short furnishes all the appliances necessary to perform the operations named with facility and uniformity. The patentee is Jacob W. Webb, of New Athens, Ohio.

BEE HIVE.—This new form of bee hive provides for perfect ventilation in summer, and protection of the bees from cold in winter, for the convenient abstraction of honey, and the prevention of injury to the bees from moths. It also provides improved support for the combs, and general facilities for the scientific management of bees. The details cannot well be verbally described. The invention has been patented by William R. Clark, of Piqua Ohio.

PAPER FOLDING MACHINE.—This is an important invention. The foldin apparatus is designed to be attached to printing presses to receive the sheets as they are deposited by the fly. It is impossible to describe in brief the ingenious mechanism which accomplishes the desired results and delivers the papers folded from the press; but it is simple and compact, and is, we judge, an important advance in this class of machinery. Mr. Richard R. Gubbins, of Troy, N. Y., assignor to himself, Patrick J. Fitzgerald and Lewis H. Dezouche, of the same place, is the inventor.