Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at $1·00 a line, under the head of "Business and Personal."

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

J. B., Jr., of Ohio.—To test the purity of white lead ground in oil, take a small portion and wash it with spirits of turpentine, to remove the oil, and rinse thoroughly with alcohol. Pour on the sample thus prepared, dilute nitric acid. It a residue remains it is sufficient indication of sulphate of baryta. The weight of this substance when separated from the solution by filtering and drying, will, when compared with the weight of the sample, give the proportion of this very common adulteration, provided sulphate of lead be not present. The clear solution which has been filtered off, may next be tested for carbonate of lime (chalk or whiting), by evaporating to dryness, and treating with alcohol. This will dissolve the nitrate of lime into which the carbonate of lime has been changed by the first treatment with nitric acid. The loss of weight in the residue after treatment with the alcohol, filtering, and drying, will indicate the proportion of carbonate of lime present in lead, provided there is no oxide of zinc present, and the amount of carbonate of lime may be determined by multiplying this loss by 56, and dividing the product by 82; the quotient will be the weight of carbonate of lime present in the sample before treatment. A mixture of lead, carbonate and oxide of zinc, prepared cheaply from an ore found in North Carolina, has been latterly used to adulterate white lead; therefore, oxide of zinc may be present. To test for this salt, add to the alcoholic solution obtained in the first washing, sulphide of ammonium, which will throw down all the zinc as a sulphide, five sixths of which will be the amount of oxide of zinc present in the sample, which must be deducted in estimating the carbonate of lime. Sulphate of lead may be present; if so, it will remain undisturbed with the sulphate of baryta, upon the first treatment with nitric acid. It may be washed entirely out of the sulphate of baryta with pure water; the loss in weight ascertained after drying the sulphate of baryta, will then indicate the quantity of sulphate of lead present. In this case the whole of the residue at first left when the nitric acid is added, is not the sulphate of baryta, and the latter must be weighed after washing out the lead salt. Whiting is not, in our opinion, as good as lead for a priming coat. Zinc white has not the body of white lead, but it does not change in color on exposure. We recommend for outside work two coats of lead and a finishing coat of zinc.

C. E. W., of N. Y.—To find the supporting power of an air chamber immersed in water, divide the weight of the inclosed air by the number indicating its specific gravity, when water is taken as the standard unit. The quotient minus the weight of the air will be the amount it will support over and above its own weight. Divide also the weight of the chamber by the number expressing the specific gravity of the material of which it is made. If the quotient be less than the weight of the chamber, subtract the difference between the quotient and the weight from the supporting power of the air, over and above its own weight, as found above; but if the quotient be greater than the weight of the material, add the difference instead of subtracting it. Perform a similar operation for each of the chains, cords, or other appurtenances to which the weights are to be suspended, successively adding the results to or subtracting from the last sum or difference found, as above directed. The final result will be the supporting power of the entire apparatus, over and above its own weight. To find what weight of any submerged material heavier than water it will support, divide the supporting power of the apparatus above determined, by the number denoting the specific gravity of the material to be supported; subtract this quotient from the supporting power, and divide the latter by the difference thus obtained. Add the quotient to the supporting power of the apparatus This result will be the weight of the given material the apparatus will support. To find the same result when the fluid is other than pure water, make the fluid itself the unit of specific gravity, or what is the same thing, divide, before making the calculation, each specific gravity number, or coefficient in the ordinary water standard table, by the specific gravity coefficient of the fluid required, taken from the same table.

N. N., of Pa.—The use of the magnet to reduce the friction of journals was proposed many years ago by James Way, of England. He fixed the permanent magnet over the vertical axle in such a manner that the weight of the wheel was nearly balanced by the magnetic attraction. Experiment showed an economy of 50 per cent. A given weight would drive the wheel 30 seconds with the magnet applied, but only 20 seconds without the magnet. We once succeeded in revolving a wheel armature suspended from a magnet, a full hour and one half in vacuo, with no increment of force after the initial force, given to it by the fingers before the bell glass was placed over it on the plate of the air pump. The weight of the armature was adjusted so as to nearly overcome the force of the magnet, and reduce the pressure between the bearing points as nearly as possible to a minimum.

W. C. & Co., and others.—We do not know the exact address of Mr. Charles Hodgson, the inventor of the English Wire Rope Tramway, or "Sky Railway" System; but by addressing him to the care of the editor of *The Engineer*, 163 Strand, London, England, you will probably receive immediate attention.

C. R. T., of Ga.—The centrifugal force of the moon and other planets results from the original force with which they were projected into space. Whatever that may have been, science has not determined it. You may spend a good deal of leisure time in trying out the problem.

T. H., of Pa.—We know of no book which specially treats of the manufacture of small fire-arms. The chambers of revolvers are generally of steel, and the parts are fitted by very ingenious and accurate machinery, of which we cannot give you a good idea without diagrams.

A. J. Wood, of Pa.—We do not believe there is any tidal action which can affect the flow of water into your mine, nor do we believe that there is any difference in the flow during the night. If this is so, however, you can easily test it by experiment.

H. H. H., of Ind.—What is meant by working steam expansively is the cutting off the influx of steam to the cylinder before the end of the stroke, and allowing the force of expansion in the steam to complete the stroke.

S. & S., of Ohio.—A cupola may be used for large brass castings, but for small work a suitable furnace is preferable, and most ordinarily employed, the brass being melted in a black lead crucible.

A. D., of Iowa.—You will find the subject of the link motion fully discussed in Auchincloss' Link and Valve Motion, published by D. Van Nostrand, 23 Murray street, New York.

A. L. P., of Pa.—Your letter about the Vertical Multiplier, with many others of a similar character, has been handed over to Mr. Fithian. Specimen papers sent as directed.

P. C. H., of Ohio.—The Painter, Gilder, and Varnisher's Companion, published by Henry Carey Baird, 406 Walnut street, Philadelphia, contains the information you desire.

W. L., of N. Y.—Stove polishes are various forms of plumbago or black lead, either in a pulverulent state, or cemented into cakes by a weak size.

D. D., of Md.—The rouge, or colcothar, used for polishing purposes, is an oxide of iron.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.

Recent American and Foreign Patents.

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

MOP WRINGER.—Charles Bradway, Maquoketa, Iowa.—This invention has for its object to furnish a simple and convenient mop wringer, which shall be so constructed that the mop may be easily and thoroughly wrung without its being necessary for the operator to put her hands into the dirty water to wring out the mop, and which at the same time may be made and sold for a trfling sum.

SELF-ADJUSTING WATCH KEYS.—J. S. Birch, New York city.—This invention has for its object to furnish a simple and convenient self-adjusting watch key which will adapt itself to the arbors of different watches, however much said arbors may vary in size, and which shall be so constructed that it may be manufactured and sold for less money than the self-adjusting watch keys heretofore made

HAND CORN PLANTER.—Henry Hickman, Omaha, Neb.—This invention has for its object to furnish an improvd hand corn planter, which shall be simple in construction, and effective in operation, and which shall be adapted for planting in sod or in plowed land, as may be desired.

CULINARY BOILER.—J. S. Bunnell, Carbondale, Pa.—The object of this invention is to construct a culinary boiler in which one, two or more separate dishes may be cooked at the same time without mixing the flavor of the several articles. The invention consists in arranging within each one of a series of vessels which are set one upon the other, a perforated false bottom, and in connecting the pipe, which conducts the steam to the said vessels, with the lower part under the false bottom of each.

RAZOR STROPS.—W. D. Evans, Philadelphia, Pa.—This invention relates to a new and useful improvement in strops for sharpening razors, whereby the operation of giving a razor a good edge is much more speedily and perfectly performed than it has hitherto been, and it consists in the use of cork beneath the outer or leather coating of the strop.

ACID AND WATERPROOF COMPOSITION.—Henry W. Johns, New York city.—This invention has for its object to furnish an improved composition for coating and saturating canvas and other woven or felted fabrics for roofing and sheathing purposes, for lining boxes and barrels, etc., and for other uses, such as bags for guano, phosphates, and other fertilizers, and forming tarpaulins, sails, cordage, seines, etc., for coating the interior of boxes, barrels, and other articles liable to injury from acids, mold, or decomposition of vegetable and animal matter, and as a body for roof coatings, cements, and preservative and marine paints, etc.

PADLOCK.—H. F. Haack, New York city.—This invention relates to a new manner of arranging and combining the bolt, tumbler, and bolt arrester in a padlock of that class which can be opened by pushing in a flat key.

CAR BRAKE.—Almerin H. Lighthall, Albany, N. Y.—This invention relates to improvements in car brakes, and consists in an improved arrangement of spring-actuated car brakes and means for tripping the springs by the act of pulling the bell-rope to signal for the stopping of the train.

BIRD TRAP.—S. M. Brooks, Memphis, Tenn.—This invention relates to improvements in traps for birds and small animals, and consists in the application to a small rectangular or other frame adapted for attachment to the ground readily, of a woven netting of any kind, and a swinging frame actuated by springs, and a setting and tripping device, so arranged that when set access is afforded to the birds or animals within the first-named frame, where they trip the swinging frame, which instantly carries the netting over them and becomes secured by a spring catch.

VEGETABLE CUTTER.—H. P. Lauer and H. G Reichard, Pottsville, Pa.—This invention relates to improvements in vegetable cutters, and consists in an arrangement in a case resembling in form an inverted, truncated, hollow cone, of a vertical, hollow, cylindrical cutter carrier as large as the interior of the shell at the bottom, and having two or more wide vertical slots, in which are hinged vertical gages to regulate the thickness of the slices to be cut, by cutters attached to the walls of the slots opposite where the gages are hinged. The top of this cylinder is geared with a hand-crank for revolving it, and the vegetables are placed on the space between the shell and the cylinder; the cut pieces are forced to the interior of the cylinder and drop out below. The hinged gages are provided with adjusting apparatus for varying the openings, for cutting thicker or thinner slices, the said apparatus is manipulated by a thick screw at the top of the cylinder.

CUTTER RACK.—W. C. Gifford, Jamestown, N. Y.—This invention relates to improvements in means for opening and closing the stanchions of cutter-feeding racks for securing and releasing the cattle, and consists in connecting the movable stanchions with the adjacent fixed stanchions by one or more bars pivoted to each, so that in opening, the stanchion is also raised, the object of which is to utilize their weight to make them self-closing. The invention also consists in the combination with the connecting bars of arms arranged to hold the stanchions open by hooking on to pins or studs in such a manner that when the cattle reach between the stanchion and down to the food they will disconnect the hooked arms and let the stanchions close by the action of gravity; and it also consists in forming the said hooked arms with spring catches to lock the stanchions in the closed position.

BENCH PIN.—H. Gabelmann, Fort Scott, Kansas.—This invention relates to improvements in bench pins for joiners and cabinet makers' use to support the boards at the side of the bench for pointing the edges, and consists of blocks of wood or metal with diagonal grooves in the sides or edges adapted for engaging in slots in the side of the bench so as to project obliquely therefrom and hold the rear end of the board in the diagonal slot by the corners of the walls of the slots cramping against the side of the board, one end of which is held in the vise, or both ends may be held by these pins, the said pins are more especially intended for side boards which are too high to joint conveniently when supported on a pin in the common way at the lower edge.

SELF-PACKING BUSH.—Carl Miller, Sandoval, Ill.—This invention relates to a new and useful improvement in a self-packing bush for mill spindles.

FORMING EXTENSION TABLE SLIDES.—S. J. Moore and G. A. Buckman Ogdensburgh, N. Y.—This invention has for its object to improve the manner of forming extension tables slides so as to make them stronger and more durable than when constructed in the ordinary manner.

GRAIN BINDER.—W. D. Harrah, Ira M. Gifford, and Edward T. Johnston, Davenport, Iowa.—This invention has for its object to furnish an improved machine for forming grain into bundles, and binding it as it passes from the reaper, which shall be simple in construction, effective in operation, and convenient in use.

POKE.—A. E. Cruttenden, Canaseraga, N. Y.—This invention has for its object to furnish an improved poke for horses and cattle, which shall be so constructed as to more effectually prevent the animal from throwing down or getting over a fence, than the pokes constructed in the ordinary manner.

EARTH CLOSET.—George G. Baldwin, New Haven, Conn.—This invention relates to a new earth closet, which is so arranged that the person occupying it may readily apply the necessary quantity of earth, and that the pan, or receptacle, can be removed and replaced when desired.

FIRE-ARMS.—Charles Felix de Dartein and Jules Edouard de Dartein, Strasbourg, France.—This invention relates to an improvement in revolving fire-arms, and consists chiefly in a novel mode of actuating and stopping the revolving cylinder.

LANTERN.—Samuel Peters, Crescent, N. Y.—This invention has for its object to improve the construction of lanterns, so as to make them simple in construction, and at the same time convenient, and safe in use, enabling the upper, or globe part of the lantern to be detached from the lower, or lamppart, with one hand.

STOVES, RANGES, ETC.—Frederick G. Cochran, St. Louis, Mo.—This invention has for its object to improve the construction of stoves, furnaces heaters, ranges, etc., for burning coal, peat, or other gaseous or fuliginous fuel, in such a way that the gases and other combustible products of said fuel may all be consumed, instead of being carried off into the smoke flue or chimney, as is the case with ordinary stoves.

WOODEN PAVEMENT.—Alexandre Trenaunay, Neuilly-Sur-Seine, near Paris, France.—This invention relates to the manufacture and application of mineralized wood blocks or slabs for paving purposes.

CARDING ENGINE.—Ferdinand Morf, Wetzikon, Switzerland.—The object of this invention is to enable the top flats or top cards to be stripped in any required succession, instead of stripping them in regular alternate succession

MANUFACTURE OF ARTIFICIAL FLOWERS AND FOLIAGE.—Octave Eugene Fillion, Paris, France.—This invention consists in making artificial flowers of a composition consisting of collodion, castor oil, and glycerin.

BALING PRESS.—Bryant F. Stroud, Marshall, Texas.—This invention has for its object to improve the construction of baling presses so as to make them simpler in construction and more convenient and effective in operation.

HEALING SALVE.—William Kramer, New York city.—This invention has for its object to furnish an improved healing salve for sores, wounds, cuts, and the various purposes for which a healing salve is applicable.

APPARATUS FOR CLEANSING AND PREPARING RAGS FOR THE MANUFACTURE OF PAPER.—William Edward Newton, London, England.—This invention has for its object to cleanse rags from the dirt and impurities which naturally adhere to them, before being operated upon and prepared for conversion into pulp for the manufacture of paper.

HARVESTER.—C. Lidren, La Fayette, Ind.—This invention relates to a new platform attachment to harvesters, which can be extended in the rear of the finger bar, to receive the cut grain, or constructed under the bar when not used, or to drop the grain. The grain is therefore deposited upon the platform, and can be raked off by hand, or may, by quickly contracting the platform, when a gavel is completed, be allowed to drop behind the finger bar.