Sympathetic Inks.

MESSRS. EDITORS:—Accidentally my attention was drawn to some information given by you to correspondents about sympathetic inks. As this subject may be interesting to many of your readers, and the knowledge it conveys may sometimes usefully be applied as a chemical test, I give here some additional information.

Sympathetic inks are of four kinds: 1. When the writing becomes visible by simply applying heat or atmospheric moisture or dryness. 2. When peculiar gases or vapors make it visible. 3. When solutions of chemical or other compounds accomplish the same thing. 4. When the simple action of light will make the writing or drawing visible (Photographic preparations).

FIRST CLASS.—No. 1. *Red Sympathetic Ink.*—Nitrate of the deutoxide of copper. A weak solution gives an invisible writing, which becomes red by heating.

No. 2. *Yellow Sympathetic Ink.*—Chloride of copper. A very dilute solution is used, invisible till heated. To make it, dissolve equal parts of blue vitriol and sal ammoniac in water.

No. 3. *Yellow and Green Ink.*—Nitrate of nickel and chloride of nickel. A weak solution forms an invisible ink which becomes green by heating when the salt contains traces of cobalt, which usually is the case; when pure it becomes yellow.

No. 4. *Green and Red Ink.*—Chloride of cobalt. A properly-diluted solution will produce a pink writing, which will disappear when thoroughly dry, become green when heated, disappear when cold, and pink again when damp. When often or strongly heated it will at last become brown red.

No. 5. *Blue Ink.*—Acetate of the protoxide of cobalt. When the solution of this salt contains nickel or iron, the writing made by it will become green when heated; when it is pure and free of these metals it becomes blue.

No. 6. *Light Brown Ink.*—Bromide of copper. Perfectly invisible writing, which appears very promptly by a slight heating, and disappears perfectly by cooling. To prepare it, take one part bromide of potassium, one part blue vitriol, eight parts of water. It is better also to discolor the blue vitriol with one part of alcohol.

Amusing Application.—A winter scene may be so executed that the green leaves of the trees and the grass on the foreground are painted with ink made from cobalt and nickel solution, No. 5; the red berries and flowers with No. 1, yellow flowers and fruits with No. 2, and the blue flowers with pure cobalt, No. 5. When such a picture is slowly and carefully heated, the invisible parts of the plants become visible, and it is as if the heat changed the winter into a summer scene. There are several other substances which may be used for invisible writing, which becomes so by heating—lemon and onion juice, milk, diluted sulphuric acid, etc., etc.

SECOND CLASS.—No. 1. *Dark Brown Ink.*—Acetate of lead. A drawing or writing with a strong solution of this salt becomes dark brown by exposure to sulphide of hydrogen gas. I developed once before my class in the Cooper Union, the life-size profile likeness of Mr Peter Cooper, on a large sheet of paper under a glass bell jar; as Mr. Cooper himself was present, and accidentally had taken seat in front of that bell jar, it excited the utmost astonishment among the occasional visitors, who were not posted up about the action of sulphur vapors on lead, till I explained that the likeness had beforehand been drawn by me on the paper with a lead solution, and that sulphide of hydrogen vapors were being developed in the bell jar.

No. 2. *Dark Blue Ink.*—Iodide of potassium and starch. Writing with this becomes blue by the least touch of acid vapors in the atmosphere, or by the presence of ozone. It is in fact the celebrated ozone test. To make it, boil starch and add a small quantity of iodide of potassium in solution.

No. 3. *Light Blue Ink.*—Sulphate of copper. A very diluted solution will produce an invisible writing, which will turn light blue by vapors of ammonia.

No. 4. *Red Ink.*—Soluble compounds of antimony will become red by sulphide of hydrogen vapor.

No. 5. *Yellow Ink.*—Soluble compounds of arsenic and of peroxide of tin will become yellow by the same vapor.

No. 6. *Flesh-colored Ink.*—Soluble compounds of manganese become flesh-colored by the same vapor.

No. 7. *Blood-red Ink.*—An acid solution of chloride of iron is diluted till the writing is invisible when dry. This writing has the remarkable property of becoming red by sulpho-cyanide vapors, and it disappears by ammonia, and may alternately be made to appear and disappear by those two vapors. To make this experiment more striking, take two wide-mouthed jars, one with some liquid ammonia on the bottom, the other with some strong sulphuric acid and sulpho-cyanide of potassium. The last salt is added from time to time in a small quantity.

Amusing Application.—As lead, antimony, arsenic, and manganese, Nos. 1, 4, 5, and 6 above, all become respectively brown, red, yellow, and pink, by sulphide of hydrogen vapors, a drawing may be made with solutions of the salts of those metals, which will show the different colors when exposed to these vapors. However, they do not disappear again, like the sympathetic inks of the first class.

To make the sulphide of hydrogen gas, pour some diluted sulphuric acid on powdered black sulphide of iron.

These are only a few of the great number of sympathetic inks of those two classes which may be made; many new ones may be found by an experienced practical chemist. The number of those belonging to the third class is still larger; to enumerate them all would take more room than this paper can afford, and I will close with only mentioning one of them:

THIRD CLASS.—*Many-colored Inks.*—A very diluted solution of chloride or sulphate of iron used for writing will turn black when washed over with a decoction of gallnuts or logwood, will turn blue by a solution of the yellow prussiate of potash, red by sulpho-cyanide of potassium, etc., or one may write with one of the last solutions, and to make it visible wash it by means of a soft brush with an iron solution.

FOURTH CLASS.—This class belongs to the photographic department. One of the simplest preparations is a diluted solution of nitrate of silver used on paper which has been washed previously with sea-water or some other diluted salt solution. This writing will become black by exposure to light.

There are also numberless other preparations of this class, but for the present the above will be sufficient. P. H. VANDER WEYDE, M. D.

Philadelphia, October, 1866.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

CARRIAGE-TOP PROTECTOR.—R. NICKSON, Akron, Ohio.—The object of this invention is to prevent and obviate the wearing away of the tops of carriages, when let down.

MACHINE FOR SCALDING HOGS.—MATHIAS STRICKER, Vincennes, Ind.—The object of this invention is to supply a cheap and convenient device for scalding hogs when butchered, enabling farmers to perform this operation much more expeditiously and perfectly than by the ordinary methods.

COTTON TIE.—J. H. GRIDLEY, Washington, D C.—The object of this invention is to provide a simple, cheap, and reliable fastening for the ends of metal ties or packing bands, particularly those used upon bales of cotton, and it consists in having one or both ends of the band cut or otherwise made in dovetail form, to fit correspondingly shaped flanges made either on the band itself or on a separate piece.

GATE.—HENRY ADAMS, Seattle, Washington Territory.—This invention consists in so hanging a gate that it can be adjusted in hight, so as to swing clear of all obstructions upon the ground.

PLOW.—JAMES HARRIS, Kansas, Ill.—This invention relates to a new and improved double or gang plow, and consists in a peculiar construction of the same, whereby a very strong and durable plow of the kind specified is obtained, and which will admit of a shovel plow being substituted for a breaking or mold-board plow, so that the device may be used as a cultivator when required.

GRAIN KILN.—NICHOLAS WALLASTER, Detroit, Mich.—This invention has for its object to furnish a kiln for drying grain conveniently, thoroughly, and in any desired quantity.

MITER BOX.—J. A. MCKINSTRY, Monson, Mass.—This invention relates to a new and improved miter box of that class in which the tangents are adjustable to admit of the moldings or other articles or stuff to be operated upon being cut or sawed to any desired angle. The object of the invention is to obtain a miter box of the class specified which will be simple in construction, capable of having its saw-guides adjusted with facility and great accuracy, and also capable of having the guides removed without any difficulty when worn by use.

CULTIVATOR.—J. B. HERMAN, Mount Vernon, Iowa.—This invention relates to a new and improved cultivator of that class in which the plows leave a vertical and also a lateral adjusting movement. The invention consists in a novel construction and arrangement of the plows, whereby the plows are retained in the ground or prevented from rising or being thrown out, and a free lateral movement allowed the two inner plows.

BRICK MACHINE.—J. B. GRIDLEY, Albany, N. Y.—In this machine the clay-compressing plunger is held down upon the clay long enough to prevent liability of expansion or rising of the clay when the plunger is raised out of contact with the same, and when the plunger is elevated, its actuating device fails to give it the downward motion until the mold or mud box has received the requisite change of clay. The main wheel or actuator is provided with horizontally-projecting flanges, which, in connection with suitable springs, serve to operate the levers which feed the molds to the plunger. A track is provided for the followers, the wheels of which are so arranged as to prevent wabbling.

CULTIVATOR PLOW.—W. O. GIBSON, Charleston, S. C.—This invention relates to a new and improved cultivator plow designe for weeding and for loosening the soil around growing plants.

SPINDLE STEP.—A. P. KINNEY, South Carver, Mass.—The object of this invention is to obtain a step for spindles and upright shafting generally, which will retain the oil or lubricating fluid, prevents the same being thrown about or scattered, thereby preventing the step and the portion of the spindle or shaft which works therein from becoming dry and consequently from heating, and also preventing parts adjacent to the step from becoming soile or greased by the oil.

THRIBBLE TREE.—J. B. MORRISON, Fort Madison, Iowa.—This invention relates to a new and improved thribble tree or three-horse splinterbar, and consists in a novel arrangement of parts whereby the draft of three horses attached thereto is equalized, and the device rendered capable of being adjusted to suit horses of different sizes, or varying powers of draft.

CORN PLOW.—PETER BARNHART, Chillicothe, Ohio.—This invention consists in the peculiar shape of the beam for a corn plow and in the form of the standards to which the shares are attached and in a movable fender which prevents the ground from being thrown on to the crops, making one of the most economical implements used on the farm.

INTERMITTEMT AND EXPANSIVE GEARING.—LYMAN B. POTTER Putnam, Conn.—This invention consists in the application of a device to spur gearing for the purpose of changing the speed of a wheel while the wheel gearing into it continues its motion without variation of velocity.

MANUAL POWER.—JOHN H. YAGER, Trenton, Ohio.—This invention is to supply a compact and powerful manual power by means of two double levers which operate together upon a double-crank shaft in such manner as to counteract the dead center and convert a reciprocating into an uninterrupted rotary motion, whereby the power applied to the levers is exerted constantly, to the greatest advantage.

CORN SHELLER.—WILLIAM COLWELL, Chillicothe, Ill.—The nature of this invention consists in constructing a corn sheller provided with a toothed cone combined with a cleaning and elevating apparatus, so that the corn is shelled from the cob and fanned or winnowed and elevated to any suitable hight for putting into sacks or wagons.

RAFTING PIN.—THOMAS B. RAYMOND, Saginaw, Mich.—This invention consists of a wedge-shaped pin so formed as to hold a straight rope, thereby removing any necessity for "cleaning" the rope.

CORN PLANTER.—W. H. COX, Virden, Ill.—This invention relates to seed-planting machines, and consists in novel and improved mechanism for dropping single kernels of Indian corn in regular succession in drills, operated by gearing connected with the driving wheels as the machine moves in the field, and also an arrangement for shifting the gearing and arranging the dropping apparatus to work by hand and plant the corn in hills.

SASH FASTENING.—BENJ. S. HYERS, Pekin, Ill.—The nature of this invention consists in so constructing a small wheel the periphery of which is corrugated and is also provided with teeth upon the end at the periphery and placed in a small metal box in such a manner that it may be applied to a window sash so as to fasten the sash at any desired point.

CORN PLOW.—RICHARD C. HOWARD, Lina, Ill.—The nature of this invention relates to an improvement in corn plows which consists in providing a rock shaft provided with levers to which cords are attached by which, through the medium of a lever, the driver is able to throw the plows out of the ground and the weight be brought upon the wheels so that it can be drawn from place to place without the plows coming in contact with the ground.

PISTON PACKING.—WM. G. SNOOK and O. C. PATCHELL, Corning, N. Y.—This invention has for its object to furnish an improved self-regulating piston packing which may be set out with any desired force when and where required by the action of the steam or water in the cylinder.

LOCK.—A. O. MILES, Nashua, N. H.—This invention relates to certain new and useful improvements in a lock previously patented. The present improvement consists in arranging the tumbler frames in such a manner that they may be moved under the action of the key in two different directions, up and down, for the purpose of varying the position of the tumblers relatively with each other, thereby obtaining a positive movement which is reliable and renders the lock far more durable and less liable to get out of repair than hitherto, and admits of the changes being effected through the medium of the key alone. The invention also consists in an improved means for retaining the bits of the key in the latter so that they cannot become detached and lost even when not secured in position to operate upon the lock.

TANNING HIDES AND SKINS.—GEORGE D. WHEELOCK, Freedom, Ohio.—This invention relates to a tanning process, which is based on the use of such chemicals, in combination with suitable quantities of catechu, sumac, or other astringent salts, that a tough, pliable, and heavy leather can be produced in a comparatively short time.

SPRING BED BOTTOM.—GABET B. DAVIS and CHAS. B. DAVIS, Freeport, Ill.—The object of this invention is to so construct a spring bed bottom as to have a uniform springing capacity, as well as also to be simple in arrangement of parts, and thus not likely to get out of order.

COMBINED STOVE-LID LIFTER, PINCERS, PAN, POT, SADIRON, ETC., LIFTER, AND HAMMER, AND TACK PULLER.—J. C. LONGSHORE, Mansfield, Ohio.—This invention consists in the combination in one implement of several articles in constant use about a kitchen, to wit, a lifter for stove covers, etc., and a tack-puller.

APPARATUS FOR DISCHARGING GRAIN FROM VESSELS.—C. H. MERRY, Dunleith, Ill.—This invention has for its object to facilitate the unloading of grain and other substances from vessels.

OIL CAN.—W. J. PRALL, Pomeroy, Ohio.—This invention is designed to furnish a neat, durable, and convenient can for holding and handling carbon and lard oils.

FUMIGATOR.—ISAAC HUTCHINS, Jr., Wellington, Me.—This invention is designed to furnish an instrument for destroying lice and ticks upon sheep and cattle by fumigating them with tobacco smoke.

CHURN.—M. BRATT, Maysville, Kentucky.—This invention is designed to furnish a churn, so constructed and arranged that the air may be forced into the churn beneath the dasher, to lessen the time required for the operation of churning, and increase the yield of butter.

HANGING OF GATES, DOORS, ETC.—W. T. WELLS, Decatur, Ill.—This invention consists in so hanging a gate, etc., that it can be adjusted either in a vertical or horizontal plane, without necessarily detaching it from its hinges or removing and re-setting them.

WASHING MACHINE.—JONATHAN J. GREEN, Grand Rapids, Mich.—This invention consists in the combination of a flexible concave with a fluted cylinder, the peculiarity of the concave being that it consist of a series of ribbed slats, joined together by a flexible belt, whereby it is enabled to rise or fall, so as to adjust itself to the clothes between it and the cylinder.

APPARATUS FOR DRYING DISHES, PLATES, ETC.—C. W. SCHROEDER, New York City.—This invention relates to a box or stand which is provided with one or more shelves to receive the dishes, plates, etc., to be dried, and with steampipes or other suitable heaters, in such a manner that dishes, plates, and other similar articles, when placed on said shelves after they have been washed, will dry rapidly by the action of the air, and the use of a towel for wiping such dishes, plates, etc., in order to get them dry, can be dispensed with.

TACK EXTRACTOR.—F. M. OSBORNE, Dover Plains, N. Y.—With this implement tacks, etc., can be drawn with the utmost ease, and with but little labor or trouble.

LOOM FOR WEAVING HATS.—PHINEAS LEESON SLAYTON and CHARLES I. KANE, New York City.—This invention is an improvement in the loom described in Letters Patent, granted to William Leeson Slayton, February 2, 1864, and November 22, 1864, where the distinct sets of weaving mechanism are employed, whereof one weaves the crown and brim of a hat, and the other the cylindrical side crown, the two sets being so arranged in the same frame that the warp carriers can be transferred from one set to the other at pleasure during the progress of the work for the purpose of weaving the different parts of a hat in due order.

CORK TONGS—J. T. ASHLEY, Brooklyn, N. Y.—With the cork tongs embraced in this invention corks can be freely and easily withdrawn from bottles, whether in their necks or inside.

CATTLE GAG.—WILLIAM KEGG, Lassellsville, N. Y.—This invention is designed for holding open the mouth of an animal for removing from its throat anything which may be choking the animal.

PROCESS OF MAKING LEAD FROM DROSS AND SCUMMINGS.—CHARLES PICKERING, St. Louis, Mo.—This invention consists in treating dross and scummings made from lead by smelting with sulphur, saltpeter, and asafetida in suita ble proportions, in such a manner that the metallic lead contained in said dross and scummings is separated from the impurities mixed therewith, and a large quantity of lead is saved which is otherwise thrown away as waste.

MACHINE FOR CRUSHING GRAIN, ETC.—CHARLES P. BENOIT, Detroit, Mich.—This invention consists in the employment or use in a machine for crushing grain and other materials, of two rollers, one of which is grooved in a longitudinal, and the other in a transverse direction, in such a manner that the grooves of one roller hold the grain or other material to be crushed in position for the other to act upon, and a machine is obtained by which the operation of crushing grain, etc., can be effected with ease and facility, and with comparatively little expenditure of power.

PIN FOR FASTENING BUTTONS, SHAWLS, ETC.—A. LINDSAY and MYRON MOSES, Malone, N. Y.—This invention relates to a new and improved mode of attaching studs, breastpins, etc., to clothing, so that they are less liable than heretofore to become accidentally detached and lost; and also to an improved device for releasing or detaching the same.

CAR TRUCK.—JOHN S. HOWARD, Schenectady, N. Y.—This invention relates to a new and improved application of elliptical springs to a car truck, whereby the truck is allowed to rock or vibrate freely, and much wear and tear of the running gear of the car avoided.

MACHINE FOR CREASING, SLICKING, AND SKIVING LEATHER.—C. C. BELLOWS, New Ipswich, N. H.—This invention relates to a new and improved machine for creasing, slicking, and skiving leather, and it relates to an improved means for supporting the lower adjustable collar, whereby the latter is prevented from springing as the leather is drawn between the two rollers. The invention also consists in a novel application of a skiving knife and also of the lower roller, adjustable collar, and in the application of a saddle-skirt creasing device, whereby a very efficient device is obtained for the manufacture of leather straps for harnesses, and the creasing of saddle skirts, etc.

PLOW.—JAMES L. ROBERTS, Brunswick, Ga.—The object of this nvention is to obtain a plow of simple and cheap construction which will be strong and durable and have a reversible land side.

WASHING AND WRINGING MACHINE.—JOHN LAMB, Jeffersonville, N. Y.—This invention is designed to furnish an improved washing and wringing machine, and it is so constructed and arranged that the clothes may be rubbed more or less as may be necessary, and then wrung by the same operation.

BROOM HEAD.—JOHN HARRIS, Marquette, Wis.—This invention is an improvement in the construction of Harris's broom head, patented May 1, 1866.

PLASTIC ROOFING.—WILLIAM L. POTTER, Clifton Park, N. Y.—This invention is designed to furnish an improved, cheap, temporary roofing for light structures, such as tents, shanties, car tops, decks, and roofs generally.

FEED CUTTER.—WILLIAM F. ALTFATHER, Johnstown, Pa.—This invention is designed to furnish an improved cutter, simple in construction, durable and cheap; and which will do its work readily and at the expense of comparatively little power.

STITCHING CLAMP.—WILLIAM W. TAYLOR, Newark, N. J.—This invention consists in combining a toggle, lever and jointed bars with the jaws of the clamp in such a way that the said jaws may be both opened and closed with the feet of the operator, leaving both his hands free to be used in adjusting the work.

CHURN DASHER.—N. H. SPENCER, Canandaigua, N. Y.—This invention consists in making the dasher bowl-shaped with horizontal holes through its sides around its lower edge, and with two or more valves in its upper part around the base of the dasher handle.

GARDEN AND POTATO FORK.—J. S. PATTERSON, Whitney's Point, N. Y.—This invention consists in the combination of a triangular fulcrum with a fork, for the purpose of furnishing a means by which weeding may be done in a garden and potatoes or other vegetables dug, thoroughly, easily and rapidly.

PUMP FOR COMPRESSING AIR, ETC.—J. N. DENNISON, Newark, N. J.—This invention consists in the employment or use, in an air-pump, of two cylinders of unequal diameters fitted with pistons which operate in opposite directions and communicating with each other by means of a pipe provided with valves at both ends, the valve next to the largest cylinder being made to open outward and that next to the smallest cylinder inward, in combination with a suitable supply pipe extending to the large cylinder, and a discharge pipe connecting from the small cylinder, each pipe being provided with a valve, that in the supply pipe opening inward, and that in the discharge pipe opening outward, in such a manner that when the piston in the large cylinder descends, the air contained in the same is compressed in the small cylinder, and in the down stroke of the piston in the small cylinder the compressed air contained therein is forced down into the reservoir containing compressed air, or into the well containing gases under a high pressure, and thereby much power is saved.

PIPE STEM.—CONSTANTINE HINGHER, New Brunswick, N. J.—The present invention consists in the arrangement of a curved tube leading from the upper part of the pipe stem down close at the inner surface of the cap, and bent in such a manner that when the pipe is laid down on either side the mouth of each curved pipe is elevated and the water or liquid in the cup is not permitted to run up into the stem.

TRANSMITTING MOTIVE POWER.—R. T. SMITH, Nashua, N. H.—This invention relates to a device intended to transmit motive power from a revolving shaft to a revolving cutter or brush, or to any other article which is secured to a handle and arranged in combination with a universal joint in such a manner that said handle together with the brush, cutter or other article can be freely turned in either direction without interfering with the motion of said brush, cutter or other articles, or with any part of the mechanism which serves to transmit the power from the revolving shaft to said brush, cutter or other article.

COUNTER-SUPPORTER FOR BOOTS AND SHOES.—JOSEPH REISING Aurora, Ill.—This invention relates to a counter-supporter which is provided with a bottom flange and with a hole in its top end in such a manner that the same can be firmly screwed between the inner and outer sole and also at its upper end to the counter, and that a supporter is obtained which effectually prevents the counter working on one side, keeping the same straight as long as the boot or shoe will last.

HAY ELEVATOR AND CONVEYOR.—A. D. HINMAN, Stepney Depot, Conn.—This invention relates to a new and improved device for elevating and conveying hay for the purpose of depositing it in barns.

THE MARKETS.

The state of business is somewhat unsatisfactory. Prices, although unusually high and with no prospect of abatement, are considered by sellers unremunerative. Money is plenty at low rates, and accommodation on fair paper is easily obtained. But this does not seem to have much effect on business generally. The cautious purchases of country merchants this fall have induced our dealers to offer inducements for long credits, a mode of doing business which we hoped had passed by. Our exports of flour and grain for the last month have been daily decreasing, while prices have not only been maintained, but have advanced; yet the incoming crop is a good one. The state of business generally is an anomalous one.

ASHES—Pots are in demand, but the supply is limited. Prices advanced to $10 00@$10 12½ ₱ bbl. Pearls are scarce, at $14.

BRICKS—Prices advanced. Common Hard, $13@$13 50. Croton, $18@$20. Philadelphia front, $60.

COAL—Foreign scarce and in demand. Lehigh, at Elizabethport, $7 50. Cumberland, at Georgetown, D. C., $5 50. Freighton Cumberland $2 25. Stove retails at $7 50@$8 50.

COFFEE—Demand for Rio. Laguayra, 18½@19c., gold; 26c., currency. Costa Rica, 20c. Java, 25½c.

COPPER—Detroit, 31@31½c.; Portage Lake, 31½c.

COTTON—Market fluctuating from reports of the English Market and of frosts at the South. Prices have, however, receded to the level of our last quotations. Ordinary, 32½c.; Middling, 38½@40½c.; Good Middling, 41@44c.

FLOUR—Prices have advanced. The supply hardly keeps pace with the demand. Common brands, $11 50@$12 85: Ohio fancy, $12 90@12 95; Genesee extra, $13 25@$15.

GRAIN—We notice considerable advance in prices. Milwaukee, Spring, $2 35@$2 40; Amber, $3 05@$3 12. Canada White, $3 25@3 30. Rye—$1 28@$1 30 for old, and $1 40 for new. Barley, Canada West, $1 32@1 33, duty paid; Western, $1 18.

IRON—Scotch Pig scarce, Prices have advanced. Glengarnock, $52@$53. American $48. Bar, refined, $105@107 50

LATHS—Are firm, with sales of Eastern at $4 25.

LEAD—Market dull. Pig 10¼ currency. Bar, 11; and Sheet and Pipe, 11½c.

LEATHER—The market for Hemlock Sole is very firm, with a fair demand. We quote Rio Grande and Buenos Ayres Light Weights, 32½@33c.; Middle do., 34½@36; Heavy do., 37@38; California Light, 32@32½; Middle do., 34@35; Heavy do., 36@37; Orinoco, etc., Light, 30@31½; Middle do., 32@33; Heavy do., 31½@33; Slaughter Upper in Rough, 33@36.

LIME—The market for Rockland is steady at $1 70 for common, and $2 10 for Lump, cash. Rosendale Cement, $1 75, cash.

LUMBER—The market for Eastern Spruce and Pine is moderately active, with sales at $22 50@$24, usual terms.

MOLASSES—Centrifugal and Clayed Cuba, part mixed, 45@47; Cuba Muscovado, 48@51½c. Barbadoes, at 58. Porto Rico, 56@75c.

NAILS—Cut may be quoted 7@7¼c., the lower rates for lots of 500 kegs and over—8d., 10d., 3d., and 3d. Fine are very scarce—Clinch, 8½ (8d are very scarce); forged horse, 32; pressed do., 22@24: copper, 50; yellow metal, 32; zinc, 20; and wrought ship and boat spikes, 7@8, cash.

SUGAR—Refining Cuba, 10⅜@11⅛. Refined, 16⅜@16½ for hard; 15⅛@15⅜, soft white; 14¼@14⅜, yellow. Crushed and granulated 16c.

WOOL—The market is greatly depressed; very little disposition to purchase on the part of jobbers or manufacturers. Unwashed Western, 31½c.; choice washed, 45c@65c.; Picklock, 70c@75c.

ZINC—9½c. less 4 per cent. for gold; 13½c., currency, for Lehigh.

Notes and Queries

J. P. W., of N. Y.—*Spiegeleisen* is a term used to denote iron containing manganese. It is from two German words meaning "mirror iron," or "looking-glass iron," and is so called from its brilliant crystals. It comes from a spathose ore found in Germany, and is a combination of four or five per cent of metallic manganese with ordinary iron. It is used to give hardness to the soft iron made by the Bessemer process, but adds carbon as well as manganese to the melting. Manganese for which *spiegeleisen* is ordinarily used, can be obtained measurably if not entirely free from carbon, by treating its oxide with charcoal, both in lumps. Iron, however, is the best vehicle for manganese, as alone it has too great an affinity for oxygen.

F. M. E., of Mo.—Rubber belts can be kept from slipping by powdered rosin. The heat of a boiler is injurious to either leather or gum belts. It burns one and softens the other.

M. C. J., of N. Y.—Oil for tempering should be animal, as whale or fish oil. Tallow is good for small tools. Any steel worker or dealer will direct you to the best quality of steel for the tools you wish to make and the work you wish to do.

O. W. L., of Ind.—A good hydraulic cement for your aquarium can be made from powdered pipe clay, three parts by weight, to one of oxide of iron, mixed with boiled linseed oil sufficient to form a paste. Aquariums put together with thin strips of rubber in the joints are, however, preferable.

C. D. B., of Md.—Mucilage from gun tragacanth is merely the maceration of the gum in water. If you cover the bottom of a common mucilage bottle with the dry gum, water will swell it in a few minutes, if stirred, to nearly fill the vessel Starch paste is not applicable to all the uses of mucilage. It will not take the place of the gluten used on postage stamps and envelopes. As a mucilage for ordinary and frequent use it is excellent. All these preparations may be prevented from souring by adding a little alcohol to the water, and may be perfumed by the use of *eau de Cologne* or essences.

A. L., of N. Y.—You ask: "Is it possible to hear a shot or shell fired from a gun pointing toward you, the distance between you and the gun being two or three miles?' Certainly it is. Sound travels, in a temperature of 60 deg., over 1,100 feet per second, and the force is a constant one, losing nothing by distance; whereas the initial velocity of a cannon ball varies from 1,100 to 1,400 feet per second, perhaps sometimes exceeding the latter number. This is, however, a constantly and rapidly decreasing quantity. In shooting four miles under any circumstances the sonnd of the explosion would precede the arrival of the shot.

J. D. F., of Washington, D. C.—We do not know and cannot ascertain any thing of the oil company you refer to. The *best* lubricating oil is unquestionably sperm. Olive and lubricating petroleum rank in our estimation next.

W. and S. H., of N. C.—Your question, "how long would it take a train of powder six inches deep and a mile long to burn," does not furnish sufficient data for a direct answer; moreover, such an answer would require experiment, which would be inconvenient for us to perform. The rapidity of burning of trains of powder depends upon a variety of circumstances in addition to the quality of the powder. A train of powder contained in a paper tube may be made to burn explosively and at the rate of over a hundred feet in a second. The burning of a train a mile long would be notably affected by the pressure of the atmosphere.

A. L., of Vt.—Liquid glue is made by dissolving glue in acetic acid No. 8, or by adding to ordinary dissolved or melted glue, a small quantity of nitric acid (1 oz. acid to 1 lb. of dry glue) and boiling. A good cement for glass and china ware is made by mixing the white of an egg with quick lime. Another favorite cement is shellac, applied melted, or dissolved in alcohol.

"O. G." thinks the deck houses or cabins of vessels as well as the galleys should be only temporarily secured to the deck, so that in case of danger they could be detached and serve as rafts. The idea is not new, but has never been considered practically useful.