RECENTLY PATENTED INVENTIONS.

Railway Appliances.

TRAIN SIGNALING DEVICE. — John Lyuch, Jamestown, North Dakota. This is a simple and inexpensive device designed to afford means to reliably signal, either by night or day, that the track is clear, or that train orders are awaiting a train from either direction. A rectangular main semaphore blade is supported on the outer end of a horizontal bracket arm, the upper half of the blade colored white, while there is a pendent auxiliary blade on each side of the main semaphore blade, colored red on the sides shown when pendent and white on the sides shown when rocked upwardly, there being journaled on the horizontal bracket arm a rock shaft for each auxiliary blade, with a device for rocking each shaft from its inner end and locking it.

CAR.—Mansel L. Heacock and Thomas H. Lovejoy, Portland, Oregon. This invention provides an improvement in car construction, affording a means whereby a car body may be conveniently and quickly changed from an open to a closed car, and *vice versa*. The sides of the body bave spaced upright posts, and a series of sliding panels is provided, there being a series of sashes above the panels pivotally connected to the car structure at their upper ends to separately swing inward and upward, with latch devices whereby when the panels are carried upward to an engagement with the sashes the two are locked together. The improved construction is designed to be simple, durable and inexpensive.

CAR. — DeWitt B. Williams, Prescott, Arizona. This is a car adapted to be readily changed from a box car to an open car and *vice versa*, and, when used as a box car, to be readily opened at any part to unload some of the contents without disturbing the rest. The platform carries corner posts which support a band formed with longitudinal slots, while a series of doors have flanges at their upper ends engaging the slots, there being a locking device for fastening the lower ends of the doors in place, and longitudinal rods for supporting the doors in an uppermost position inside tbe car.

CAR HEATER.—Lawrence Haas, Grand Crossing, Ill. The body of the heater provided by this invention is designed to be set in the car floor, so that its top will be flush with the floor. Around the fire pot is a jacket, forming an inclosed chamber, in the lower part of which is a spiral partition, oppositely arranged funnels communicating with the lower part of the chamber, while a valve is pivoted between the funnels. The air entering the funnel is compelled by the partition to take a spiral course around the fire pot, by which it is heated and is passed into pipes leading to both sides of the car. When the car travels in the opposite direction, the valve changes automatically to direct the air into the opposite funnel, whereby the heated air will pass upward as before.

RAILWAY TIE.—Thomas C. Anderson, Moscow, N. Y. This is a metal tie consisting of two vertically separable parts, the upper of which has inclined bridges near the ends, and wedges adapted to fit between the bridges and the bottom portion of the tie. The object is to produce a cheap and durable tie so constructed that it may be easily laid and will hold the rails securely in place, while it may be readily adjusted in any kind of weather to bring a rail to the desired height, and also has all the elastic qualities of wood.

BELL RINGER. — John L. Baker, Baird, Texas. This is a device especially designed for use in locomotives, being effective and automatic, and arranged to impart a uniform motion to the bell crank shaft without jar or pounding. The invention consists of a cylinder provided with a steam chest in which is beld a plunger valve, three plungers being arranged to lead the motive agent from one end of the cylinder to the other end to form a cushion for the piston.

SPRING BOX FOR CAR COUPLINGS.—Patrick P. McMahon and George M. Wilcoxson, Chattanooga, Tenn. This is a detachable box or case for the secure retention of a buffer spring for a car coupling which will permit the spring to be changed quickly if broken, and which can be utilized in conjunction with different styles of drawheads. The box consists of two parallel side walls having interior stiffening webs and exterior locking ribs, and two transverse apertured walls integral with the side walls and forming therewith a spring chamber, the side walls projecting beyond the transverse walls.

SWITCH LOCK.—Jos. Judge, Pittston, Pa. Combined with a switch stand having a notched keeper is an apertured switch lever and a lock consisting of an apertured casing and a spring-pressed bolt in the casing, the keeper being adapted to pass through the aperture of the switch lever and be engaged by the bolt of the lock. The lock is so made and located that the moment the switch lever is in position to close the switch it will automatically be locked to the switch standard, and the switch lever cannot be released except with a key. The lock is simple and of few parts, and cannot be opened by striking or otherwise jarring its exterior.

Agricultural.

CORN HARVESTER.—James W. Miller, Stewartsdale, North Dakota. The construction of this device is such that the portion containing the drop mechanism and cutting blade or blades may be carried downward to cut close to the ground, or carried upward to cut the corn some distance from the ground. The cutting knife is also adjustable to any desired angle or vertically, and means are provided whereby the cut corn may be effectually guided to dumping platforms which are capable of being operated by the driver of the machine at will. This harvester is designed to be of very simple, durable, and inexpensive construction, and it is especially adapted for cutting a corn growing in the Northwest, the ears of which project from the stalk at or with their stems below the ground line.

WEEDER. — Frank Hulse, Goshen, N. Y. This is a simple machine designed to take the place of hand work, and adapted to be pushed along the ground over a row of plants, when it will pull the weeds from between the plants, thoroughly stirring the soil, and without injury to the plants. Shoes adapted to run upon the ground are secured to the lower ends of the handle bars, and converging spring fingers are arranged between the handle bars, the fingers having means for vertical adjustment.

FEED FOR THRASHING MACHINES.—Elmer E. Logan, Larned, Kansas. This invention provides a force feed of simple and inexpensive construction, capable of attachment to any thrashing machine. It consists of a toothed feed cylinder arranged above and in advance of the thrashing cylinder, and adjustable toward and from it, its teeth passing between those of the thrashing cylinder, while a carrier or elevator belt delivers to the feed cylinder. A regular, continuous and uniform force feed is thus obtained, and very satisfactory results are also realized in the process of thrashing.

Miscellaneous.

DITCHING MACHINE.—Louis A. Desy, Montreal, Canada. A swinging scoop frame is hinged at its upper end to the main frame, there being chain wheels in the lower end of the scoop frame, and the scoops are so arranged that each alternate one will cut the center of the trench and the others the edges. The ditching devices are mounted on a car or platform, and the latter is mounted on a wheeled truck. The machine is especially arranged for digging trenches of a uniform width, such as gas pipe, water main or sewer trenches, the parts being readily adjustable to dig a deep or a shallow trench. The engine has two driving sprocket wheels, one belted with the scoop-operating devices and the other arranged to be connected with the traction devices.

HYDRAULIC STUMP EXTRACTOR. — Alfred Taylor, San Francisco, Cal. This is a simple and powerful machine which may be quickly applied to pull a stump or other object to be lifted, and is easily and rapidly operated. It consists of a main frame carried on wheels and provided with crank axles, a cylinder carried by the frame baving an open upper end, while a movable piston is mounted in the cylinder and projects from its upper end, the piston having a grooved head at the top adapted to carry a lifting cable, a pump carried by the frame being connected with the lifting cylinder and with a source of water supply.

WINDOW. — Jean J. Eyraud, Paris, France. This is a simple form of window which may be swung open in the usual way, and which can also be tilted or rocked to allow the air to pass above and below it. The invention comprises a vertically-swinging frame to which horizontally-swinging sashes are hinged, there being a fastening device for fixing the position of the frame, a hinged plate or shield preventing currents of air.

BOAT PROPELLING MECHANISM. — William H. Dick, Dansville, N. Y. This is a mechanism especially adapted for row boats, canoes, and such small craft, and designed to be quickly and conveniently placed in position in the boat or removed from it, being adjusted in position to the size of the boat. The seat is supported on the base of the mechanism, and upon a standard are adjustable arms supporting journal boxes in which are adjustably journaled shafts carrying paddle wheels, the paddle shafts being operated by chain belts from crank shafts. No rudder is required, as each paddle is operated independently, and no fastening devices are necessary, the weight of the device and of the operator being sufficient to hold the mechanism in place.

BEAM CLAMP AND HANGER.—William W. Canby, Philadelphia, Pa. This invention provides a novel construction of adjustable clamps for I or other shaped beams, girders, etc., to be used as a hanger for steam, gas, water and other pipes, and also applicable to bridge building or iron construction work of different kinds. The opposite jaw or clip-shaped clamp sections are provided with bent legs at their inner ends, longitudinally slotted base portions being fitted to slide one upon or under the other, the upper one having nut-locking ribs, in combination with a bolt and nuts above and below the base portions of the legs securing the clamp sections together.

HOUSEHOLD ALTAR.—Leo C. Beaudet, New York City. A compact and ornamental altar table is provided by this invention, adapted to be folded to produce an inclosing box or cabinet in which the adjunctive candelabra and vases are kept, but which may be quickly unfolded into altar form to support the sacramental altar service ware. A telescopic supporting standard and base therefor is also provided, affording a column of proper height to sustain the table suitably elevated, or allow the entire device to be greatly reduced in height if desired.

WAGON JACK. — Frederick Finsterer, Avon, Montana. Combined with a toothed lifting bar fitted to slide and a hand lever carrying a lifting hook adapted to engage the toothed bar, is a bolt fitted to slide and engage the toothed bar while being actuated from the lifting hook. The construction is simple and durable and very effective in operation, being arranged to automatically and securely lock the lifting bar in place to support the load.

CAN OPENER. — Anthony Ward, New York City. The main portion of this device is formed of a single length of wire bent to form a handle at one end and a pivot at the opposite end, the cutter baving an aperture through which the wire is passed when the cutter is secured in fixed position on the wire. The device is very simple and inexpensive, and the blade is so formed that the walls of the kerf produced will be quite smooth, and when the knife is introduced into the head of the can it will not have a tendency to leave the head during the process of cutting.

CULINARY VESSEL. — Seth Williams, Sing Sing, N. Y. An improved article of manufacture is afforded by this invention, being a vessel of that class in which an inner receptacle of earthenware, granite ware, or other material, is inclosed in an outer metallic casing in such manner as to form a space or chamber for the access of heat around and in contact with the walls of the inner vessel without the vessel being exposed to the direct action of the fire. The vessel is of very simple and inexpensive construction, in which the heat from the fire will be deflected and guided to impinge upon the interior vessel at its sides and the edges of the bottom.

BURNER. — Theodore A. Williamson, Allegheny, Pa. This is a hydrocarbon burner for cooking or heating purposes, and has a bottom plate formed with a coil, connected with one end of which is an oil supply, a back plate resting on the bottom plate having a channel connecting with the other end of the coil, while one or more burners on the back plate are connected with the channel to receive the gas and oil supply. The device is simple and durable in construction, and arranged for convenient insertion and use in ordinary stoves.

MUFF. — Catharine Booss, New York City. This invention provides a simple and inexpensive device which may be easily applied to a muff to hold it in correct shape, and by which the muff may be attached to the persen. A ring, either flat or round and preferably yielding, is secured within the body of the muff, and in one side of this ring is an outwardly extending ear from which extends a chain to the free end of which a bracelet is attached, to be worn on the wrist.

SHOE HORN. — Newton A. Dickinson, Essex, Conn. This is an improvement on that class of shoe horns which have a pivoted lever to press the heel portion of a rubber or leather shoe against the lower portion of the horn, thus forming a clamping device for pulling on the shoe. The lever has its upper end curved to form a finger hold and a roller is mounted longitudinally on its lower end, the lever being pivoted to the born and adapted to swing in a plane parallel to it. The lower ends of the horn and lever may, if preferred, be convex and concave, whereby they are adapted to fit together.

EARTH AUGER. — Bradford Lane, Carlton, Oregon. This is a device especially designed for use in digging post holes, the cutting blades being rigidly supported from a single handle, and the blades being curved or concaved transversely and having inturned bottoms, with slightly diagonal bottom edges, one side and the bottom of each blade being sharpened. This auger is calculated to effect the cutting of a large hole in an easy and expeditious manner, enabling a large bite to be quickly cut and compactly held while being removed.

PENHOLDER.—Theodore O. Earle, New York City. This holder consists of a cylinder with an opening in one side and a lever having a movable fulcrum in the cylinder, one end of the lever engaging a pen while its other end has a button extending out through an opening flush with the outer face of the cylinder. The penholding attachment adapts itself to pens of different thicknesses, and the pen is effectually clamped and held in proper position for use, or may be quickly and conveniently released and removed without soiling the fingers.

CLASP.—George W. Kuchler, Yonkers, N. Y., and Hermann C. Fischer, New York City. A device which may be utilized for clamping either heavy or light articles is provided by this invention. It is of the caliper type, in which the free or clamping ends of the arms are normally held apart by a spring, a locking lever being provided capable of forcing the arms to close upon material of varying thickness and lock the arms in such position. The device is simple and inexpensive, and when made in small size for a garment clasp, the locking may be effected by one hand.

INKSTAND. — George W. Galbreath, Sedalia, Mo. This is a fountain inkstand, in which an apertured cap secured to the body carries a hollow flexible ball with top and bottom apertures, the lower one registering with the aperture in the cap, a tube being carried by the ball, the tube being attached at its upper apertured portion and extending at its lower end downward within the body of the stand. The moment a portion of the attachment is pressed downward the ink flows upward to meet the pen, so that the ink is presented to the pen only when needed, the ink ordinarily remaining in the body of the stand, where it is protected from dust, etc.

POLICE NIPPERS.—Samuel A. French, New York City. The body of the nippers is made in the usual way, and consists of two pivotally connected members, each embracing a handle of essentially L shape, and a curved arm integral with the bandle, but the construction is such that the nippers may be conveniently manipulated by one hand, and so that the moment the lock latch or lever is released the arms of the nippers will automatically assume an open position. The action of the lock latch or lever is also more easy and certain than heretofore, and its construction and location such that when the nippers are carried in the pocket they will not present sharp edges to tear the clothes.

AGING WHISKY. — John H. Halligan, Huntsville, Texas. This invention provides an apparatus designed to affect whisky in a very short time in much the manner that it is affected by allowing it to lie in barrels for a term of years. The apparatus consists of a cylinder, the lower part of which forms a heating chamber, while suspended in its upper part is a whisky holding tank, the arrangement being such that the whisky may be unequally heated to give it a slow rotary motion within its tank. It is designed in practice, by thirty days' treatment with the apparatus, to give whisky the apparent age of from eight to ten years.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THE OPTICS OF PHOTOGRAPHY AND PHOTOGRAPHIC LENSES. By J. Traill Taylor. London: Whittaker & Co.; New York: Macmillan & Co. 1892. Pp. viii, 244. Price $1.

This little work should be designated as both practical and timely. It is practical because it covers the ground of the construction, relative good and bad qualities, manipulation and testing of lenses. Mounts and cells, the grinding of lenses and special cases are also treated. It is timely because in these days a photographer should know something about the tools of his trade and should not be satified to merely make the exposures. He should know something of what this book teaches.

MONEY, SILVER AND FINANCE. By J. Howard Cowperthwait. London and New York: G. P. Putnam's Sons. 1892. Pp. v, 242. Price $1.25.

The author of this book is opposed to the free coinage of silver. In his preface he speaks of "the ludicrous spectacle of thousands of men devoting their time and labor to the taking of silver out of the mines, where it could do no harm, for the purpose of placing it in the Treasury's vaults, whence its monstrous bulk menaces the industries and the general prosperity of the country." Such a writer has evidently the courage of his conviction, and such a quality is a commendation of his book.

ELECTRIC LIGHT CABLES AND THE DISTRIBUTION OF ELECTRICITY. By Stuart A. Russell, with 107 illustrations. London: Whittaker & Co. and George Bell & Sons. 1892. Pp. xi, 319. 107 illustrations. Price $2.25.

This accession to "The Specialist's Series" is worthy of a warm welcome. It is a book written, not for the meeting of the requirements of some English "exam.," but for the working engineer. The thoroughly practical nature of the work is evidenced by its topics, such as different methods of cable construction, economical current density in conductors, series, multiple arc, three-wire and five-wire distribution, and many others. Underground lines and systems receive very full consideration, American and English examples being liberally drawn upon. Calculations are employed throughout the work, but the mathematics are kept well within range of the general practical engineer.

THE ELECTRIC RAILWAY IN THEORY AND PRACTICE. By Oscar T. Crosby and Louis Bell Ph.D. New York: The W. J. Johnston Co. 1892. Pp. 400. Price $2.50.

With nearly 150 illustrations this book is a very good contribution to one of the most important branches of electrical engineering. What the railroad of the future will be, and what part electricity will play in its development is altogether conjectural. This book tells what the aspect of the subject is to-day. The subjects of prime motors, electric motors, and car equipments, the line track and station economy, storage battery traction, high speed service, and commercial considerations are typical subjects. In the five appendices considerable useful information is given, notably a section on lightning protection, by Professor Elihu Thomson.

MICHAEL FARADAY, MAN OF SCIENCE. By Walter Jerrold. New York and Chicago: Fleming H. Revell Co. (No date.) Pp. 160. Illustrated. Price 75 cents.

The story of Faraday's life, fascinating in its details of his inauspicious start in life, and of his later work, which stamped his as one of the greatest minds that England ever produced, is given in graphic and popular form in this little volume. The tale is an inspiring one. The illustrations of places connected with the philosopher's life give the book additional value and interest.

THE TANNINS. By Henry Trimble, Ph. M. Vol. I. Philadelphia: J. B. Lippincott Co. Pp. 168. Price $2.

This is a monograph on the history, preparation, properties, methods of estimation, and uses of the vegetable astringents, with an index to the literature of the subject. The latter cannot fail to be especially valuable to any one proposing to conduct experiments in this line, as it appears there has been quite a library published in regard to the tannins. The kind of information which the tanners are looking for, however, that which will enable them to readily determine the absolute and relative tanning values of different tanning materials—seems to be but little nearer their reach than it was brought by the experiments of Sir Humphry Davy in 1803. It is not yet certain but that there are as many kinds of tannin as there are of tanning materials.

ESSENTIALS OF PHYSICS ARRANGED IN THE FORM OF QUESTIONS AND ANSWERS. By Fred. J. Brockway, M.D. Philadelphia: W. B. Saunders. 1892. Pp. 330. Price $1.

This "quiz compend" purports to give the essentials of physics for medical students. It is always an open question what the essentials are. In the case of this book we feel that we award it much praise in stating that we believe most medical practitioners satisfy their consciences with a far more meager allowance of physics than we have here presented. It would prove, we believe, a useful manual for teacher's use in other than medical schools.

A MANUAL OF MINING. By M. C. Ihlseng, C.E., M.E., Ph.D. New York: John Wiley & Sons. 1892. Pp. x, 428. Illustrated. Price $4.

This work is a treatise on mining engineering from the aspect of an American. In this sense it is specially valuable. The works on this and kindred subjects have hitherto been to some extent hampered by tradition. The preparatory work, methods, extraction of ore, application of electricity and water power, pumping, ventilation and many other heads might be quoted in addition to show the exhaustive way in which the topic is

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treated. A list of authorities quoted, and of "manufacturers represented in the illustrations" (meaning, we presume, manufacturers' machines and appliances, as we see no portraits) are commendable features. A peculiarly full index closes the work.

ELECTRICITY AND ITS USES. By J. Munro. London: The Religious Tract Society. Fleming H. Revell Company, New York and Chicago, sole agents. 1890. Pp. xv, 208. Price $1.40.

The oft-trod ground of popular description of electrical appliances is traversed in this attractive volume. Its neat shape and numerous illustrations make it a contribution of some value, although in so crowded a field.

PRACTICAL DIRECTIONS FOR ARMATURE AND FIELD MAGNET WINDING. By Edward Trevert. Lynn, Mass.: Bubier Publishing Co. 1892. Pp. 113. Illustrated. Price $1.50. No index.

This book is of interest now when so many amateur electricians are experimenting with motors. The directions for winding, while not going very deeply into the subjects of sizes for given power, etc., are clear and simple, and so expressed as to be understood easily. The last portion of the work, a little less than one half, is devoted to an outline of the principles of commercial motors and dynamos, and contains a few useful tables.

PRACTICAL CENTERING. By Owen B. Maginnis. New York: William T. Comstock. 1891. Pp. 80. Illustrated. Price $1.50. No index.

The hand of the practical builder and constructor appears in the pages of this book. The thoroughly practical cast of its text and the many useful hints scattered through it make it useful reading for all who are engaged in the class of engineering work of which it treats. The concluding chapters on house carpentry are excellently conceived and put before the reader.

The Shoe and Leather Reporter Annual for 1892 is a volume of nearly 750 pages. The main portion of the book is a directory of the boot and shoe manufacturers, tanners, dealers in leather and findings, hides, furs, etc., and manchinery manufacturers, in the United States and Canada, with names of prominent firms in other parts of the world. It also has particulars as to the organization of a number of trade bodies in different cities, and various other matters of interest in the shoe and leather trades. Published by the *Shoe and Leather Reporter*, New York.

SCIENTIFIC AMERICAN
BUILDING EDITION.

MARCH NUMBER.—(No. 77.)

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1. Elegant plate in colors of a residence in the Queen Anne style of architecture. erected for F. S. Andrews, at Seaside Park, Bridgeport, Conn. Perspective view, floor plans, etc. Longstaff & Hurd architects, Bridgeport, Conn. Cost $7,000 complete.
2. Plate in colors of a cottage at Richmond, Mo. Perspective elevation and floor plans. Cost $1,500.
3. A residence at Cleveland, O. An admirable design. Floor plans and perspective elevation. Cost about $6,000.
4. A cottage at Gardner, Me., erected at a cost of $1,900. Perspective elevation and floor plans.
5. Floor plans and perspective view of a Colonial house at Portland, Me. Cost $3,800 complete.
6. Design for an ornamental chimney piece.
7. A cottage at Portland, Me. Cost $3,500 complete. Perspective and floor plans.
8. Floor plans and perspective view of a very attractive Queen Anne cottage erected at Babylon, L. I. Cost complete, $2,800.
9. View of the proposed Odd Fellows' Temple at Chicago. To be the most imposing structure of its kind in the United States, and the tallest building in the world. Height 556 feet.
10. Sketches of an English cottage.
11. An attractive residence recently erected at Belle Haven Park, Greenwich, Conn., at a cost of $11,000 complete. Floor plans and perspective elevation.
12. A residence at East Park, McKeesport, Pa. An attractive design. Plans and perspective. Cost about $4,000.
13. A cottage at Asbury Park, N. J. An excellent design. Cost $5,300 complete. Floor plans and perspective elevation.
14. Miscellaneous contents: Lawn planting; how to do it and what to avoid, with an illustration.—A suggestion for inventors. — Acoustics. — They bought burning houses.—Timber in damp places. —The taper of chimneys.—Stained cypress.—Low ceilings.—An improved woodworking machine, illustrated.—A fine machine for cabinet shops, illustrated. — Swezey's dumb waiter. — Graphic representation of strains. — An improved door hanger, illustrated.—A new woodworking machine, illustrated.—The baths of Diocletian.—The Stanley plumb and level, illustrated. — The Diamond Match Company.

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Notes & Queries

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INDEX OF NOTES AND QUERIES.

(4116) F. E. H. asks (1) Is there any way to oxidize nickel? A. To oxidize nickel give it a thin coating of silver and oxidize with sodium sulphide solution, or try dipping the nickel into a solution of mercurous nitrate and then treating with sodium sulphate solution. 2. How is etching done on souvenir spoons? A. For silver etching we refer you to the SCIENTIFIC AMERICAN, No. 15, vol. 65, query 3445.

(4117) P. B. W. asks: 1. Will you publish how to cure a cigarette habit? I have been a slave to it for the last 5 years. A. Quit the dirty habit at once and forever. 2. What is good to take the pain out of my breast that the nicotine has made? A. Stop smoking. 3. Is there a substance that you can put in your tobacco that will kill the nicotine? A. No.

(4118) W. R. B. asks: 1. What size wire should I use for a telegraph relay magnet? A. Use No. 32 or 34. 2. Of what sized iron should I make my iron core? A. ⅜ inch diameter and 1¼ inch long. 3. How long and thick should the wire coils on the relay cores be? A. The length of the core and 1¼ inch outside diameter. 4. Please state some way of softening cores? A. Heat them to a cherry red and bury them in ashes overnight. 5. What kind of iron should I use? A. The softest wrought iron. 6. What size wire and coils should I use on my sounder to work on short circuit, on a circuit of two or three miles? A. No. 24 for local and No. 32 for line. 7. If I made the parts of my instrument of iron, would it be better to temper the iron or leave it soft, to give the best sound? A. If you use iron, leave it soft. For all parts except the magnet cores, yoke and armature, brass is preferable to iron.

(4119) T. C. S. writes: 1. What chemical could I put into a glass and let dry and in a little while, by pouring water or some other chemical into glass, turn it (the water or chemical) black or any different color? A. For black add a little nut galls and iron sulphate, both in powder. For blue use ferridcyanide of potassium in place of the nut galls. Excellent effects may be produced with aniline colors in very small quantity. 2. Would a 40 ohm telegraph sounder work with two batteries on a line of ten or fifteen feet? If not how could I remedy it? A. Yes; but it should have more battery. 3. How do you make the solution of a gravity battery? A. Use pure water, and drop the crystals of copper sulphate into the bottom. A few teaspoonfuls of salt or of sodium sulphate may be dissolved in water and added to start the battery.

(4120) J. M. writes: I desire to learn of some absorbent that can be used in connection with the storage of certain perishable products, such as eggs. I want to find something that will absorb gases and odors, without giving off any odor itself. You are aware, no doubt, that in machine storage, it seems necessary to keep rooms tight, and consequently any gases given off are confined in the rooms. It is this I want to get rid of, as it seems to affect the articles of the more delicate kind of perishable merchandise. A. We would suggest the use of a strong solution of potassium permanganate exposed in shallow vessels. Bone charcoal would also have a good effect.

(4121) J. B. says: 1. He has been trying aristotype paper, and succeeds well except when mounting. After printing and toning I throw the prints into cold water and wash in several waters for two or three hours. I use starch paste new made, but perfectly cold and thick enough to be stiff when cold. I take the print from the water and lay face down on glass and put blotting paper on it, and that takes away all water. I then brush paste over the print carefully, taking care to cover every part of it. I then lay the print on the mount and squeeze it down perfectly flat. I generally wipe off with wet white cloth. I often use a handkerchief, wringing it as dry as possible before using. It is now all right to all appearance. If I place them between blotters to dry, the paper makes them woolly, for it sticks to the blotting paper. If I lay them out on a table to dry, they get along all right till they get pretty dry, then the corners begin to turn up, and sometimes the sides leave the mount too. The man I buy my paper from says to treat the paper as albumen paper. I have tried it every way, and I have lots of trouble with it, and am a little doubtful about it. Please send me a good formula for toning aristo paper, also directions for mounting and burnishing. A. A better mounting paste than starch for aristotype prints is:

Nelson's No. 1 photo. gelatine	4 ozs.
Water	16 ozs.
Glycerine	1 oz.
Alcohol	5 ozs.

Dissolve the gelatine in warm water, then add the glycerine, and lastly the alcohol. This is said to prevent cockling. Alum should be used in the toning and fixing solution to harden the surface. A combined toning and fixing solution is made up as follows:

1. Hypo	10 ozs.
Add water to make	36 ozs.

When dissolved add 4 ozs. of powdered alum.

2. A. Sulphocyanide of ammonia, c. p.	1 oz.
Dissolved in water	2 ozs.
B. Dry chloride of gold, c. p	15 grains.
Chloride of ammonia	60 grains.
Dissolve in water	2 ozs.

Add B to A in small portions, shaking after each addition till the precipitate formed is redissolved, then filter. This solution should be clear and colorless and be kept in a yellow bottle.

3. Nitrate of lead	90 grains.
Water	2 ozs.

Different tones can be made by various combinations of the three solutions.

Warm tones.	No. 1	8 ozs.
	No. 2	2 ozs.
	No. 3	2 drachms.
	Water	6 ozs.
Purple tones.	No. 1	8 ozs.
	No. 2	3 ozs.
	No. 3	4 drachms.
	Water	5 ozs.
Cold tones.	No. 1	8 ozs.
	No. 2	4 ozs.
	No. 3	4 drachms.
	Water	4 ozs.

The bulk of the solution may be lessened by using one-half or one-quarter the proportions above stated. After the prints are dry, and before burnishing, rub the following lubricator over the surface:

Cetaceum (spermaceti)	10 grammes.
Castile soap	10 grammes.
Alcohol	1 kilogramme.

This will give a good gloss. 2. Are the roller burnishers ahead of the other kind? A. They are considered superior. 3. The other day I sensitized some albumen paper with nitrate of silver, and after printing and toning I found it all covered with little blisters about the size of a pin head; at least they seemed to me to be blisters. The paper looked like pebbled leather. Was it my fault or the fault of the paper? A. Blisters generally occur when the solutions are of uneven temperature. All solutions should be between 70° and 80° F. Make the fixing bath one ounce of hypo. to eight of water, and to each gallon of this add two ounces of alcohol and two drachms of ammonia 0·880°. This is said to prevent blisters.

(4122) Young Electrician asks: 1. What number of the SUPPLEMENT contains the construction of the electroplating outfit? A. See SUPPLEMENT, No. 310. 2. What becomes of the energy that is employed in splashing water in a churn? A. It is dissipated in the form of heat. 3. How are storage batteries constructed, and how many cells would it take to light eight 16 candle power lamps through an evening, the plates in the cells to be 10 in. by 8 in. by ⅛ in.? A. Consult SUPPLEMENT, Nos. 322, 677, 685, 342, 426, 455. It will require 11 cells for 20 volt lamps.

(4123) H. S., A. L. S., and others ask how to restore a meerschaum pipe which has been burnt. A. Place corks in both the bowl and stem hole of the pipe, and place for one minute in boiling milk, if the pipe is to be slowly colored and hard, and for the same length of time in boiling beeswax, if the pipe is to be colored quickly.

(4124) G. D. C. asks: 1. Can the simple electric motor described on page 498, "Experimental Science," be run by the gravity battery? If so, how many cells would it require to run the motor at 500 revolutions per minute? If the gravity battery will not run the motor, how many cells of Dr. Gassner's dry battery will it take to run the motor, or will it run it at all? A. Neither the gravity nor the dry battery is suitable for running the simple motor. The motor has very low resistance and requires a battery of low resistance. 2. If the motor be connected up as a dynamo, or as the motor should be and run at about 500 or 1,000 revolutions per minute by foot power, would it give a current of electricity which could be felt by any one, without an induction coil? A. The motor does not act well as a dynamo. It generates only a very slight current. For a dynamo, wind the armature and field magnet with finer wire and use soft cast iron in the field magnets.

(4125) Tel. writes: I am making telescope as described in "Experimental Science." I have an acromatic objective glass 2¼ in. diameter, 44 in. focus. The other glasses are eye lens, ¾ in. focus, field lens 2 in. focus. Should I have tube 40 in. long? I had already made the tube before I got glasses, and it is 32 in. long. Will that do as well? A. The 32 in. tube will answer. You can make out the length of the tube by means of a draw tube.

(4126) M. D. writes: 1. I am making the motor described in SUPPLEMENT, No. 641, and would like to know if the core of the armature could be made of a coil of sheet iron instead of the wire? Would it give as good results? A. Sheet iron will not answer as well as wire. 2. Would this same armature do for other motors with field magnets of solid iron instead of Russia iron? A. Yes. 3. How many cells of storage battery would it require to run this motor, and how many gravity cells will be required to charge the storage battery? A. Two cells of storage battery. The gravity battery is not suitable for running the motor, but will answer for charging the storage battery. 4. What is the least number of volts required to run this motor? A. Four. 5. What size dynamo would this motor run? About how many lamps would the dynamo light, each about ten candle power? A. A very small one. So small in fact, that it would not be of much account practically. It is poor policy to run a dynamo by an electric motor driven by batteries. Better make use of the battery current, which is much greater than you could produce in the manner suggested. You might possibly run one or two lamps of smallest size. 6. Would this motor run a 16 ft. canvas boat? How could the speed be regulated? A. Yes; slowly. You would hardly need a speed regulator. The regulation, however, can be effected by introducing more or less resistance in the circuit. 7. Could this motor be made more powerful by increasing dimensions? A. Yes; but we do not advise basing the calculations for a larger motor on the dimensions and proportions of this. 8. In what number of SCIENTIFIC AMERICAN SUPPLEMENT would I find a description for simple dynamo? A. Nos. 161 and 600. 9. How could the battery be fixed to keep it from splashing out by the movements of a boat? A. The battery may be provided with a close fitting cover having a small vent tube.

(4127) H. M. T. asks: Can you give instructions for making a Ruhmkorff coil? A. Consult SUPPLEMENT, No. 160.

(4128) W. A. H. writes: 1. I have a glazed earthenware vessel, the right size for a porous cup, but know of no way to take off the enamel. Could you suggest one? A. The glaze cannot be removed. Better purchase your porous cells. They cost very little. 2. I have a single fluid four-cell battery, each cell consisting of a number of electric light carbons with a leaden ring cast around one end and a rod of zinc, well amalgamated in the middle; inside is solution of salt and water. After being worked through a door bell a few days the current diminishes, but the difficulty is removed by cleaning the zincs. Even then the current does not exceed two and one-half volts. A film seems to come over the zincs. Could you tell me of any way to get more current without so much trouble? Have tried sal-ammoniac, but the current does not increase. Is the zinc surface too small? A. Convert you battery into a Fuller battery by placing the zinc in a porous cell having mercury in the bottom, into which the zinc dips. Place bichromate solution outside the cell and water inside. The carbons will, of course, be immersed in the bichromate solution. A current is measured by amperes, not by volts, hence your characterization of your current is meaningless.

(4129) H. A. A. asks: 1. Why is the induction coil described in "Experimental Science" wound as two coils? A. To prevent the passage of sparks from one end of the coil to the other. 2. I want to make an induction coil about 4 inches long by 2 inches in diameter; will a ½ inch core be large enough? A. The core will do. 3. How much and what size wire will I require? A. Use two layers of No. 18 in the primary, and fill the spool with No. 36. 4. I saw a core made inside of a brass tube, and to decrease the current the tube and core were both pulled out. Was this right or should not the core be stationary? A. It is right to have both the brass tube and the core movable. The brass tube may be omitted if the core is movable. 5. How can I splice some pieces of No. 26 wire together to use on an induction coil? A. Twist it together neatly and solder with soft solder, taking care to wash off all traces of soldering fluid to prevent corrosion. 6. Is there a SUPPLEMENT through which I can get some hints on making an induction coil like the above? A. None that gives other information than that contained in "Experimental Science." 7. Please make the following from "Experimental Science," page 550, clearer. A piece of quite thin brass should be bent together in a U form, and the wire should be allowed to pass through the channel thus formed. A. The U shaped piece of metal is designed as a guide. It rests on the coil while the winding progresses and the thickness of the metal determines the space between the convolutions.

(4130) J. J. O'D. asks: How to work Mushett steel to the best advantage, and how to temper it. A. Work Mushett steel in the same manner, and with the same care, as high tool steel. Must not be heated beyond a full red. Requires no tempering. When the tool is finished under the hammer, lay it down to cool. Sharpen as other tools on the grindstone or wet emery wheel.

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