ENGINEERING INVENTIONS.

A method of operating trains on cable railroads has been patented by Mr. Paul H. Mayor, of Owego, N. Y. This invention covers a special combination of the cable and locomotive systems of propulsion, and is mainly designed to be applied to steep grades, but is also applicable to varying grades, where an incline is interrupted by levels, contrary grades, etc.

An alarm signal for hot journals has been patented by Messrs. Oliver H. P. Cornelius and George H. Turner, of Turner, Ore. A thermometer is suitably placed in contact with a journal bearing, with which is connected a wire from a battery, so that when the mercury reaches a certain point a circuit will be closed and an alarm signal sounded.

An improved pitman box has been patented by Mr. Fenner Darling, of Franklin, Mass. The invention consists principally of an inner sleeve placed upon the wrist pin, the sleeve being adapted to be revolved intermittently by the movement of the pitman, so the wrist pins of the pitman boxes are relieved of part of the wear and retain their cylindrical form.

An improved car door fastening has been patented by Mr. Jacob Rhule, of Pittsburg, Pa. A hasp with a hook end and a slot at the opposite end is held on the door by passing its hook end through an eye bolt in the door frame and passing a staple in the door through the slot in the opposite end of the hasp, whereupon a bolt or the hasp of a padlock is passed through the staple on the door.

An improved car coupling has been patented by Mr. Frank L. McQuiston, of Greencastle, Iowa. The invention provides for a drawhead having attached a crossbar provided with bearings, in which slides a rod with stop pins and a spring, and carrying a coupling pin bent to pass horizontally through the drawhead, the device being applicable to a car with ordinary couplings by using a link made with a half twist.

A coking furnace has been patented by Mr. Arthur R. B. Holtawski, of Zaborze, Upper Silesia, Germany. Between a series of coking chambers are gas chambers, into which gas is passed from the coking chambers, the gas chambers having openings in their bottoms leading to transverse channels, connecting with longitudinal channels below the gas chambers, so the gases will circulate until exhausted, and thus all be consumed as the coal is converted into coke.

A roasting furnace has been patented by Messrs. Newman A. Foss and John M. Gray, of Clendenin, Montana. The object is to improve roasting and slagging furnaces, for which purpose a long tube of boiler iron, lined with fire brick, is arranged between the receiving chamber and the chimney, and smaller in diameter from the furnace to the chimney, with inside ledges, down which the ore falls in passing from one section to the other, having a more complete exposure to the heat.

MECHANICAL INVENTIONS.

A circular sawing machine has been patented by Mr. George J. Kautz, of Emporium, Pa. This is an improved construction and arrangement of parts for that class of circular sawing machines in which the saw frame is automatically swung into position by a cam, and the feed roller is also automatically operated.

A skein lacing and tying attachment for reels has been patented by Mr. George Grimshaw, Jr., of Paterson, N. J. By this improvement time is economized, the skeins are less liable to become tangled in dyeing, the thread can be more readily wound, and will be freer from knots than when the skein has been laced in the ordinary manner after having been reeled.

A boring gauge has been patented by Mr. Thomas J. Bush, of Lexington, Ky. This invention relates to three former patents of the same patentee, and consists in adapting the gauge to be held and the means for holding it upon a railroad tie parallel with the rail, so the intersecting diagonal holes for receiving the bent bolts may be bored in the tie at the side of the rail instead of crossing under it.

A ratchet wrench has been patented by Mr. Charles Wechsler, of Minneapolis, Minn. The wrench head is provided with a system of concentrically arranged angular sleeves or slides, of decreasing size to the center, but which extend through the head to form a right hand wrench on one side and a left hand one on the other, these sleeves or slides having rectilinear slots, guided on pins, so they may telescope freely, and this head is combined with a ratchet handle.

A machine for washing, scouring, and burring wool has been patented by Mr. James E. Sinclair, of Baltimore, Md. This machine covers all three of these operations in preparing wool for carding, the fibers being first thoroughly separated and agitated in cold water, and from thence pumped into a scouring apparatus, where only a brief treatment with hot water is necessary, whence the wool is pumped into a burring and picking apparatus, where it is rinsed in cold water and burred and picked, and then discharged from the machine in condition to be dried and then carded.

AGRICULTURAL INVENTIONS.

A horse hay rake has been patented by Mr. James M. Clark, of Greeley, Colo. This rake is adapted to be dumped by the rotation of the axle, and an improved means is provided for holding and operating the devices for controlling the action of the rake.

A hay stacker has been patented by Mr. James H. Johnson, of Greencastle, Mo. The object of this invention is to facilitate the operation of stacking hay, which is effected by a movable apparatus, whereby, when a horse is attached to the hoisting rope, a loaded fork is raised into an upright position, and the hay discharged upon the stack.

An improved plow has been patented by Mr. J. T. Ellyson, of Pleasant Plain, Iowa. In combination with the mould board and a flanged bar secured thereto is a slotted forked plate carrying a roller, disk, and scraper at its forked end, and there is a bolt on the flanged bar for adjustably fixing the slotted upper end of the plate.

An automatic register for grains, seeds, and other substances has been patented by Mr. John Wherry, Jr., of Putnam, Ill. There is a grain register in a two-compartment case, with an adjustable guide plate connected by levers and rods, with hinged bottoms having elastic bars engaging with weighted scale beams, so arranged as to measure grain, seeds, etc., as they come from the thrashing machine or bin.

A pea thrasher and cotton opener has been patented by Mr. Calvin H. Simmons, of Munford, Ala. There is a perforated sheet metal or woven wire concave, with spikes or teeth, and a revolving shaft with other teeth, preferably bent or curved reversely, to hold straw, lint, etc., away from the bottom and walls of the case, keeping the perforations open, through which the peas, grain, etc., escape.

A thrashing machine has been patented by Mr. Andrew T. Hawley, of Alton, Ill. It is intended to prevent waste of grain and thoroughly separate the latter from the straw. There is a heavy beater adjoining the thrashing cylinder and revolving in an opposite direction, with a light beater above and in rear of the heavy one, but revolving opposite thereto, so the straw will be received from the cylinder by the heavy beater and thrown upward, and as it falls be subjected to the light beater.

MISCELLANEOUS INVENTIONS.

An improved button has been patented by Mr. William W. Beach, of New York city. This invention consists of a button with a transverse aperture in the shank, into which may be received or through which may be passed the point of a pin.

A horse detacher has been patented by Mr. William M. Walker, of Fulton, Ky. This is an improved device for detaching the trace and shaft of the carriage, with a foot lever arrangement for working the same and a brake.

A coin holder has been patented by Mr. Charles C. Johnston, of Jackson, Miss. It consists of two semi-cylindrical sections or casings hinged to each other at the adjoining ends, into which sections the coins are placed, and is simple in construction and cheap.

A hive cart or hand cart, specially adapted for shifting bees from place to place, has been patented by Mr. Charles R. Thompson, of Fort Omaha, Neb. The handles of the cart serve as levers for lifting the bee hive on low hung carriers, so a heavy hive may be lifted and moved without calling for much outlay of strength.

A ripping attachment for scissors has been patented by Mr. Francis S. Loockerman, of Manokin, Md. A casing is secured to the under side of one of the handles, and there is a ripping blade pivoted to and adapted to fold within said casing, in connection with which a spring may be used or not as desired.

A binding attachment for sewing machines has been patented by Mr. Robert Hilgner, of New Orleans, La. This invention covers a special construction and combination of parts to make a sewing machine binder as an attachment for guiding a binding to be sewed upon the edge of a garment.

A fire escape has been patented by Mr. Robert P. Clark, of Philadelphia, Pa. A cage is suspended by operating ropes from a horizontal traveler, said ropes passing over guide pulleys and being attached to drums revolved in opposite directions by connecting gear wheels, and operated by a crank, so the cage may be moved either vertically or horizontally.

A clay pulverizer has been patented by Mr. Lorenzo D. Ferguson, of Nashville, Tenn. The pulverizing machine combines plain rollers and toothed cylinders running at different speeds, so that the clay will not form in cakes or sheets as passed through, but will be thoroughly pulverized, for making bricks or fine ware.

A huller, cleaner, and separator has been patented by Mr. William W. Jackson, of Bethany, La. This invention combines a fan, inclined sieve, rotary toothed hulling cylinder and stationary toothed case, so devised and constructed as to make a simple and effective machine for stripping or clearing the hulls or pods from peas, beans, etc., and separating the same.

A supporting rod for window and door curtains has been patented by Mr. John A. Browne, of Philadelphia, Pa. A socket is fixed to one side and a screw plug to the other side of the casing, in line with each other; then one end of the rod is inserted in the socket and on the other end is fixed a socket nut, which is screwed upon the screw plug.

An adjustable finger ring has been patented by Mr. Benjamin Lewkowitz, of New York city. In combination with a stone frame with inclined pockets on the sides is a removable shank, its ends passing into the pockets, the shank being held in place by screws passing through the edges of the pockets and adapted to bind on the edges of the shank.

An improved grain drier has been patented by Mr. William H. Applegate, of Atlantic, Iowa. There are special constructions of grain passages, discharge valves, and heating apparatus, with provision for the escape of moisture, and for the air heated from below to ascend about the grain passages, also for the escape of any dust, and for maintaining a free air inlet.

A fire escape bracket has been patented by Mr. Charles Murdock, of New Rochelle, N. Y. This is an improvement for use in connection with the fire escape patented by the same patentee last year, and covers a special construction of bracket to be attached to the window casing or wall of a building, to admit of its being folded down to or swung away therefrom.

An improved elevator has been patented by Mr. Riley L. Davis, of Mooresville, N. C. This is a novel arrangement and combination of parts for elevators with adjustable scaffolds on the lazy tongs principle, additional pairs of lazy tongs being used, their knees connected in a flexible manner, and the platform having slotted pendent guides.

A lasting machine has been patented by Mr. Augustus W. Pearson, of Nyack, N. Y. In a suitable frame fronting the operator, jaws are made to seize the upper, as held up in proper connection with the last, pull the upper over and hold it on the last, while an automatic tack feeding arrangement and hammer fix the upper under the desired strain to the last, in close imitation of hand lasting.

A fire escape has been patented by Mr. Thomas B. Peacock, of Topeka, Kansas. It is an inexpensive apparatus, consisting of a car suspended by a rope, combined with a ring and pulley adapted to bear against a suspension rope; and with a lever and pulley also adapted to bear against the rope, so that a number of persons can safely and rapidly escape from a burning building.

A scaffolding bracket has been patented by Mr. Mark N. Knight, of Skowhegan, Me. It is formed of two pieces of timber with notched edges, one having at its upper end a pivoted link through which the outer piece of timber can be passed, or which link passes through a slot in the other piece of timber, making a bracket simple and strong for staging and scaffolding in rooms and on buildings.

A pneumatic coal cleaner has been patented by Mr. Amour Sottiaux, of Strepy-Bracqueguies, Belgium. In connection with a case having an open side and receptacles across its bottom, with means for introducing material at its upper part, is a contrivance admitting air at varying pressures, by which, as coal drops, it may be separated from dust, and from stones, schists, or slates.

A fertilizer distributer has been patented by Mr. Augustine Reger, of Somerville, N. J. The invention consists of a pail with a perforated bottom, on which is a cover with apertures in its lower edge, through which the fertilizer escapes to and drops through the perforated part of the bottom; a cone is also provided for, to be fixed to the under side of the bottom, with its apex at the bottom.

An improved glove has been patented by Mr. S. Oscar Parker, of Littleton, N. H. This invention provides for a peculiar cutting of parts and arrangement thereof, so there will be a double thickness of leather on the wrist over the pulse, and there is a button piece for the opening at the wrist which strengthens the glove and gives it a better appearance, with other advantages.

An improved book case has been patented by Mr. William A. Smith, of Wilmington, Del. This invention provides special devices for locking books in book cases, and may be fitted with equal facility to an open front case or to book cases having their fronts closed with either sliding or folding doors. The locking frame is of vertical bars or mouldings connected by horizontal cross bars or mouldings.

A steam cooker has been patented by Mr. Hudson Maxim, of Pittsfield, Mass. The steam from a generator is carried in a spiral or back and forward under the generator, to be highly superheated, whence its open end is passed into the bottom of the cooking vessel, the heat being thoroughly utilized therein, and the arrangement being adapted for cooking vegetables, meats, etc., very rapidly.

A telephone call bell switch has been patented by Mr. Louis Townsend, of Evansville, Ind. A peculiar torsional spring tube is combined with the telephone support; and this spring tube is embedded in the walls of which the box is composed; there is, also, a peculiar construction of the contact points, the telephone support always having a solid electrical connection with the circuit wire.

A fastener for fence wires and boards has been patented by Mr. Charles E. Griffith, of Storm Lake, Iowa. This invention is principally for providing an improved means of attaching wire or board fences to trees, and covers a device of slotted plate combined with screw bolt, head, and bit, for holding the members of the fence at a distance from the post or trees.

A clock pendulum has been patented by Mr. Levi Orser, of Mobile, Ala. This invention covers a rolling or rocking suspension device, made in such manner as to give two curved lines or points of contact, upon or between which the pendulum is held by its own gravity when the clock is in its proper position, and there is a guard to prevent the parts from misplacement when the clock is turned out of its normal position.

A spring bed bottom has been patented by Mr. Butler R. Platt, of Plainwell, Mich. The invention covers a special construction and combination of parts, in that the connecting portion of each pair of springs has two bends which serve as points of attachment for the hooks of the coupling, preventing them from slipping, and so the springs cannot be forced out of vertical position, also giving a large surface area for the support of the bedding.

A circuit closer for telegraph keys has been patented by Mr. Samuel J. Spurgeon, of Houstonia, Mo. This invention is an improvement on a circuit closer patented by the same inventor last year, and covers a circuit closing spring or lever pressed against the bottom of the key, the circuit closing lever being pressed downward to break the circuit when the key button is depressed by a button and stem held loosely on the button of the key.

A draught equalizer has been patented by Mr. David F. Robbins, of Berlin, Minn. The object is to provide means for attaching four horses abreast to a harvester, so that each horse will draw its proper proportion, and to this end a cross bar is attached to the tongue with pulleys at its ends, around which passes a chain, one end connected with a whiffletree, and the other with an ordinary 3-horse evener, the connections being made as for properly proportioned levers.

A sash cord fastener has been patented by Mr. William A. Sinsel, of Waukesha, Wis. It provides means for a cord being firmly held without being tied, independently of the means for securing the holding device to the sash, and the device has a body, a cap therefor, and a screw, forming a cord clamp and means for holding the same to a sash. The same inventor has also obtained a patent for a window sash, in which, according to one of the specified modes of construction, the sash may be removed from the window casing without removing the window stop.

NEW BOOKS AND PUBLICATIONS.

BLEACHING, DYEING, AND CALICO PRINTING Edited by John Gardner, F.I.C., F.C.S. P. Blakiston, Son & Co., Philadelphia. Price, $1.75.

This book presents mainly a condensed summary of what has heretofore been presented in more elaborate works. It will make, however, a convenient manual for practical workers who do not wish to give the time and trouble required for more extended research, and contains a good selection of approved recipes, indicating the familiarity of the editor witb the more recent English and French methods.

THE MODERN HOUSE CARPENTER'S COMPANION AND BUILDER'S GUIDE. By W. A. Sylvester. Cupples, Upham & Co., Boston. Price, $2.00.

This is a standard book of its kind, and has reached its third edition. It is written for workmen, by one who commenced his preparation for the task in the memoranda made during early experience at the trade. Explanations of the mathematical questions arising in ordinary carpentry and building are fully given, with great plainness of statement and ample illustration. The book is one which any apprentice may study diligently with profit, and which most master builders might find it of advantage to frequently consult.

HINTS ON THE DRAINAGE AND SEWERAGE OF DWELLINGS. By William Paul Gerhard, C.E. William T. Comstock, New York. Price, $2.50.

Every topic of importance touching dwelling house sanitation here receives some attention. Illustrations are given of many different kinds of closets, traps, sinks, piping, etc., with practical directions for securing good plumbing and detecting that which is bad. The book is a valuable contribution to the literature of the people, on the subjects of which it treats, is plain and direct in its statements, and every householder can learn something therefrom relative to improving the sanitary conditions by which he is surrounded.

GEOLOGICAL SURVEY OF ALABAMA, 1881–82, WITH AGRICULTURAL FEATURES. By Eugene A. Smith, Ph.D., State Geologist.

This is an eminently practical book, containing a great deal of what might be styled basic information for all present or would-be agriculturists in the State of Alabama. So far as the geology of the State is concerned, there are, perhaps, no points of especial scientific interest to be developed. There is only a small portion of the State, in its northeastern section, where the elevation above the sea equals 500 feet, and the geologist's work is principally confined to an analysis of soils which have come into their present place in a perfectly natural and easily understood way. But the different lands of the State are well mapped out, their formation and chemical composition graphically represented, the different varieties of natural and artificial manures required in various localities fully discussed, and analytical details of present productions given in the most attractive style. The State presents great inducements for agriculturists, particularly in cotton growing, having an area greater than that of the State of New York, without one-quarter of the population.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) G. H. B., Cleveland, O., asks how skins are dressed to render them soft enough to make clothes of, and what is the Indian process? A. Most of the buffalo robes and other heavy skins are either lightly tanned in bark liquors, or tawed with alum and salt, and well worked and dressed with oil. Most skins can be easily prepared for single skins by rolling up with salt and alum sprinkled on the flesh side, first having been well scraped; this wants to be repeated several times, and the skins finally well worked. The Indians rub the brains and fat of animals thoroughly into the flesh and smoke well; the squaws, who always do this work, being obliged to work the skins with great thoroughness.

(2) A. C. R. asks: What is the best, cheapest, and most simple way to dry clays, where it is desirable to have all moisture evaporated, and from to ten twenty tons per day being required, the clay being about the consistency of stiff putty when taken from pit? A. The fire brick makers dry the clay that is to be baked for making fire sand, by placing the lumps as dug out of the pit upon a hot floor of fire tile, which is the cover of a series of flues to a furnace. A coil of steam pipes might be used, but it is expensive. Another way, which is very economical as to heat, is to build a brick room as large as may be convenient for your requirements with shelves all round upon which the clay can be piled. In the center of the room place a heater or large stove; have the pipe turn down upon the floor and around the sides of the room before entering the chimney, so as to save all the heat. In such a room the temperature may be raised to 250°, which will dry very fast. Ventilate slowly. Experience will give you the best practice in regard to ventilating. As a general practice it is found best to close the room tightly for a few hours so as to heat the contents to the highest degree and then open the ventilators. The air for the furnace may be taken from the outside of the room through a pipe.

(3) J. T. asks: How can I unite by casting a piece of mushett steel to the end of a piece of cast iron 1⅛ square by 7 in. long? The steel is 1⅛ square by ⅛ in. thickness. A. Make a core print to correspond with the steel, lay the steel in the mould, gate beneath to allow the iron to escape, and pour and waste perhaps one or two pounds so as to heat the steel; then plug up the waste gate and fill the mould.

(4) C. A. K. asks: What kind of liquids or gas are fire extinguishers charged with, especially the new hand grenade of Chicago, Ill.? A. Fire extinguishers are generally charged with carbonate of lime or carbonate of soda and water, with a combining quantity of sulphuric acid in a position to be discharged into the water at the required time. We do not know the construction of the Chicago hand grenades.

(5) H. B. C. says: In answer to D. D. L., query No. 19, Dec. 22, I clean my mica as follows: Take them out of stove, lay on a smooth board, and with a stiff bristle brush dipped in concentrated ammonia brush the surface until it feels smooth and glossy, then wash off the dirt and rinse with soft water. If the mica is not shelly, they will be as bright as new. Shelly or mica of poor quality can only be cleaned by stripping.

(6) W. H. writes: Will you tell me the reason that an ax at one corner and sometimes both cracks in tempering it, and how to prevent? Also a good receipt for small springs, such as main spring to gun locks, and other small springs? A. To prevent the cracking of an ax in hardening, have the iron poll split to receive the steel bit; not the bit to receive the poll. Heat the iron as well as the steel, and plunge into clear cold water until chilled. Use the best of cast steel for gunlock main springs. Forge to size. Do not use a file on the springs. Heat over a charcoal fire, harden in water, and draw the doubled-over portion to a blue.

(7) J. W. H.—Inquiry No. 8, SCIENTIFIC AMERICAN of Dec. 1, 1883, concerning quantity of water for boiler. In our reply we should have said cubic foot instead of gallon. The inquiry and answer as corrected stand as follows: How many gallons of water are required for a steam boiler per horse power, say at 60 pounds pressure? A. At the Centennial Exhibition and tests, 30 pounds steam per horse power per hour was taken as standard; this is a little less than half a cubic foot of water, but it depends much on the character and condition of the engine through which the steam is worked. The quantity of water may vary from one-third of a cubic foot to two-thirds of a cubic foot and even one cubic foot in a very bad engine.

(8) S. R. asks: Will any fellow reader acquaint me with any cheap liquid that will keep an even temperature (or nearly so) the year round? What are the non-conducting properties of oils or water glass?

(9) H. S., of Russell, Kas., asks the specific gravity of pure milk by a lactometer? A. The specific gravity of milk varies with the different breeds and age of cattle, the season of year, and kind of feed. We have records of specific gravities ranging from 1·035 to 1·04, the variation being due to the proportions of casein, sugar, salts, and fat. The excess in casein, sugar, and salts produces the heavier specific gravities, while the grades containing an excess of fat globules (cream) are of the lighter specific gravities. The lactometer measuring only the always slight variations between the weight of milk and that of water, must be very accurate to afford any guide, and we have known farmers who reported a difference of 20 degrees in the milk by a lactometer in four weeks' change from feed to good pasturage in the spring. The actual amount of water in milk is very regular at about 87 or 88 per cent, though its cream or butter producing qualities vary much more widely.

(10) H. W., of Frankfort, Ky., asks about ventilating a drying room 8 x 12, and 6 ft. high, in which there are 400 ft. 1 in. pipe for heating, present arrangement not working well? A. The steam coil should be 5 or 6 in. above floor; the flat kinds are the most efficient. The ventilation inlet should be under the coil so as to spread the air as much as possible; the outlet also should be at several places, so that the current through the room will be nearly equal in all parts. Openings equivalent to 1 square ft. are sufficient for a room of 600 cubic feet and 400 ft. of 1 in. pipe.

(11) W. T. says: I am told that a thermometer in which, on being inverted, the mercury breaks in running to the top of the tube is not reliable; that instead it should form a vacuum in the bulb. Is this right? A. Theoretically, and with an absolute vacuum above the mercury, the latter should, when inverted, fill the tube. But when the latter is very small a slight cause, a little roughness, or obstruction too diminutive to be seen with the naked eye, may cause a parting, and the instrument still be practically useful. It is very desirable to have a thermometer as perfect as possible. The break in the column does no harm provided it does not separate in the proper use of the instrument.

(12) J. B. F. M. asks: 1. Is the Blake transmitter as good as any? A. For general purposes, yes; it, however, lacks power for long distances. The Hopkins transmitter, by actual test, has proved the best for long distances. 2. Is the induction coil in the Blake transmitter composed of more than one sized wire, and what sizes and amounts are used? A. Yes, two layers of Nos. 16 and 18 insulated copper wire are wound in a coil ⅜ in. diameter by 1½ in. long for the primary, and over that is wound from five to six layers of No. 34 silk covered wire for the secondary wire. The resistance of the secondary coil is usually 150 ohms. 3. If a larger coil was used than ordinary, would it give better results? A. No, except for long lines of great resistance; then a larger coil is better. 4. What is the spring made of that carries the platinum point? An alloy of tin and brass something like German silver, to give it softness and elasticity. 5. What kind of carbon is used? A. Fine French battery carbon highly polished. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 163 and 150.

(13) A. S. P. writes: I have been trying to electroplate with two jars, Grenet battery, 7 in. high, object about 1½ in. square. I get a deposit of copper, but it takes a long time and consumes too much zinc. What is the fault? Can I not get good effects with that battery? A. Use two or three cells of gravity battery. The Grenet is not well adapted to electroplating.

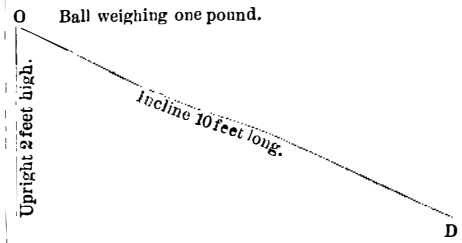
(14) W. W. M. says: I have a glass wheel, the remnant of an old electrical machine. It is about 2 ft. in diameter and ⅝ in. thick. Can it be utilized in making a Holtz machine? If so, what thickness would be best for the additional wheel? A. It is a curious fact that plate glass is worthless for a Holtz machine. The natural surface of ordinary blown glass seems to be necessary to the successful working of the machine. Your plate would answer for a frictional machine.

(15) J. H. B. asks: 1. Is not properly secured cistern or rain water the best for drinking and cooking purposes? A. We do not consider that cistern water in its best condition is equal to water drawn from sand or rock beds, but is no doubt better than the water of many wells. 2. Is there any danger arising from the use of water in brass or copper vessels? A. Brass and copper vessels that are kept scrupulously clean are suitable for cooking in or holding water for drinking. Brass pipe for conveying water is now much used, and is not considered more dangerous than lead pipe. 3. What effect, if any, has the rubber pipe upon water secured through it, such as our lawn and sidewalk hose? A. Rubber hose has no deleterious effect upon water. 4. Where is the best water found when exposed to the sun and air, and standing in open vessels—at the top or bottom of the vessel? A. We do not know that there is any difference in the quality of water drawn from the top or bottom of an open vessel, provided both vessel and water are clean.

(16) W. W. asks: What is the best material to mix with gas tar to form a durable waterproof coating for tin, shingle, or paper roof? A. Boil the tar with lime, stir in powdered slate, and then apply.

(17) F. T. K. G. writes: I was much interested in the article entitled "The re-enforcement of deficient water supply in wells," which appeared in the SCIENTIFIC AMERICAN of November 10, but it does not explain how to manage where there are large quantities of granite bowlders, which is the case in many parts of the country. A. The deepening or re-enforcing of wells located in bowlder strata is not easy work. It requires much judgment and patience to bore out the sand and fish out the bowlders as they are laid bare. The strainer pipe should be much larger than those used for wells in clear sand strata. Sounding the substratum of the well with a small iron rod pointed and driven down several feet at different places close together and near the center of the well will generally reveal its condition as to the number and size of the bowlders, and will suggest the size of the strainer, which should be large enough to allow the bowlders to be drawn up with a finger grapple. The sand may be taken out as in the process before described. The bowlders can be loosened with a hook and taken up with the finger grapple. If the bowlder catch under the edge of the tube, bore down near it and below it and work the bowlder toward the center with a hook, where it can be caught with the grapple.

(18) E. D. C. asks for a rule by which he can solve the following problem:



Question: With what force will the ball weighing one pound strike an upright at D, having traveled the ten foot incline? A. A body acquires the same velocity in descending any inclined plane as by falling freely through a distance equal to the height of the plane minus the friction due to the manner of moving down the plane. The impact in foot pounds equals the velocity multiplied by the weight. To get the velocity, multiply the space fallen through by 64·333, and the square root of the product will give the velocity acquired in feet per second. In your case $\sqrt{2 \times 64{\cdot}333} = 11{\cdot}334$ feet per second, $11\,334 \times 1$ lb. $= 11{\cdot}333$ foot pounds. In practice this has been exceeded under favorable circumstances 4·426 times, so that you may obtain in practice any value in pounds for a one pound ball, from 11 to 44 pounds.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

J. N. T.—The specimen is probably infusorial earth, but it is too gritty to be of much use for polishing purposes. It has no commercial value in New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 5, 1884,

AND EACH BEARING THAT DATE.

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