NEW BOOKS AND PUBLICATIONS.

DIE HAUS UND HOTEL TELEGRAPHIE. Bearbeitet von O. Canter. Wien, Pesth, Leipzig: A. Hartleben's Verlag. Pp. 217, mit 104 Abbildund. Price 3 marks=4 francs.

This little book forms the 14th volume of the electro-technical library. The author is a practical telegraph man, and gives a full and practical description of the subjects related to electric bells, annunciators, automatic burglar and fire alarms, electric clocks. telephones, microphones, etc. In the first chapter the different kinds of batteries are described and illustrated, also current breakers, switches, galvanometers, battery testers, rheostats, etc. Ohm's law is explained, also the meaning of such terms as electromotive force, tension of current, and the effects of induction. In the second chapter the bells, push buttons, receiving, sending, and recording instruments are fully explained with excellent cuts. The third chapter is devoted to automatic instruments, alarms, door contacts, foot contacts, clock contacts, electric winding clocks, door closers, thermoscopes, and automatic fire alarms. In the fourth chapter the wires and cables are described, and directions given for finding and remedying defects and other disturbing causes. The book is intended as a text book for those engaged in putting in house telegraphs, and offers instructive reading for all who are interested in the practical applications of electricity. The mathematical formulas are given for calculating resistances, strength of currents, size of wires, and other important practical data. In the appendix the prices (in Vienna) of the different instruments and supplies are given.

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 indentification.

(1) C. A. S. V. G. writes: Take a round stove pipe 6 inches in diameter at both ends and 2 feet long; then compress one end to an oval form so as to fit on to an oval opening in a stove, "compressing without stretching." Does the circular end contain a larger area than the oval end? The undersigned says it does. A. The circular end of the pipe has the larger area.

(2) E. F. R. Z. asks: Are there saws made to saw limestone? If so, where could I get one? A. Limestone is usually sawed with thin strips of iron and sand. A small piece may be sawed with a machinist's hack saw. A strip of tin stretched upon a frame like a wood saw with emery and water will do very good work for an experiment.

(3) G. E. writes: Supposing a ship of any nationality to sail from any port whatever, and to circumnavigate the globe, at what point on her course is it customary to add or drop a day from the calendar, in order that on again reaching her point of departure the day of the week according to her reckoning may coincide with the actual local day? A. Marine reckoning is generally assigned to the meridian from which the longitude is reckoned. The chronometers keep the time at such meridian without regard to the position of the vessel in longitude. The log book days are from sun to sun, and are a serial from the commencement of the voyage. If the vessel has sailed around the world, a day has to be added or deducted at some point of the voyage for a new reckoning. This is usually done at a 180° from Greenwich, which is about middle of Pacific.

(4) Le R. T.—Your diagrams of slide valves received. No. 2 is the most correct. No. 1 is bad, and No. 3 very bad. No. 2 would be improved by say $\frac{1}{16}$ inch to $\frac{1}{8}$ inch exhaust lap

(5) J. F. P. asks for the best whitewash. The wash is to be used for rough planks. A. The result of experience in the manufacture of this article is given under the title of "A Durable Whitewash" on page 52 of the SCIENTIFIC AMERICAN for July 23, 1881.

(6) R. M. K. writes: I wish to prepare many pictures (wood cuts, lithographs, etc.) for wonder camera, by transferring on plates of tin or tinfoil slides, to get strong reflection from them on screen. 1. What varnish can I use that will not blister and crack on such slide? A. A good shellac varnish is the article generally used, and will probably answer your purpose. 2. Also repeat method how to "split" a piece of paper, on which there are two engravings on opposite sides. A. How to split a piece of paper will be found on page 99 of SCIENTIFIC AMERICAN for February 17, 1883.

(7) J. H. M. writes: I have a difficulty in soldering small silver articles. I can't get the solder to run till I use so high a temperature that I fuse part of the article which I wish to solder. What solder and what flux should I use, and what part of the blow pipe flame is right? A. A soft silver solder, which is probably the article you need, may be prepared by melting one part of lead; when the latter is fluid add two parts of tin, using a small piece of resin as a flux. In soldering fine work wet the parts to be joined with hydrochloric acid, in which as much zinc has been dissolved as the acid will take up. Borax can be used as a flux. The pointed flame of the blow pipe is best, and should be directed on the parts to be soldered.

(8) A. Z. asks why acetate of soda absorbs more heat than any other material and retains it for a longer period. I have not found the *rationale* of this in any work on chemistry that I have consulted. I have an idea that the heat absorbing and retaining properties of acetate of soda may be applied to some other practical purposes than that of warming railway cars. A. Sodium acetate has a large percentage of water of crystallization combined with it, which is enough to dissolve the salt when the crystals are heated. When this liquefaction takes place, a great deal of heat is rendered latent. As the fluid cools, it solidifies and gives out again the latent heat, thus taking a long time to return to its original temperature.

(9) F. F. writes: I see in your answers to correspondents you mention a furniture polish (shellac varnish). Can you inform me where I can get it, or how it is prepared? A. The following receipt is used by cabinet makers: Very pale shellac, 5 lb.; mastic, 7 oz.; alcohol, (90 per cent), 5 or 6 pints; dissolve in the cold with frequent stirring. This is used for French polishing, etc.

(10) A. E. I. asks: 1. How the rubber is treated in the manufacture of rubber stamps; and 2, what is used for the mould? A. For answer to 1 and 2 see SCIENTIFIC AMERICAN SUPPLEMENT, No. 83. 3. How to make a "red" gold color in electroplating, with a bath that gives a yellow color. A. The anode used should be of the "red" gold variety of metal, which in its turn will become deposited upon the surface to be plated.

(11) C. Bros. write: We use a tubular boiler, the flues of which are rather thin and weak; which method of cleaning the flues would be preferable—with steam from dome or with an iron cleaner? We wish to favor the flues as much as possible. Carry about 20 lb. steam. A. Clean with steam from the dome.

(12) E. D. F. writes: If an iron tube be placed on a boiler the same as water glass tube, with an outlet from the boiler at both ends, and a steam tight piston be fitted in the tube, in what part of the tube will the piston stand if the tube be fastened to the boiler the same as water glass tube is, so that the tube will stand about half full of water? Will the piston rise and fall with the water? A. It will rise or fall with the changes in the level of the water, leaving friction out of the question. Of course the piston will settle in the water, until it displaces a quantity equal to it's own weight.

(13) J. B. J. writes: 1. I have charge of an engine 30 x 36 in., 12 in. wrought iron crank shaft, with Babbitt bearing. It is a new engine. Will not run without water when working hard. It is well in line, but the Babbitt metal don't seem to have "backbone" to stand up to the work. What is best to be done in the case? I filled the side bearings about two months ago. The metal used was coarse looking. I don't think it was the right kind, for the trouble still remains. A. Your Babbitt metal is probably too soft. It is made of all qualities and degrees of hardness. Very little of that sold in market is *true* Babbitt metal. 2. What is meant by hammering Babbitt into a box? A. Hammering the metal is for two purposes—to fill the recess perfectly and harden or condense the metal.

(14) J. A. asks: 1. What is the principle of a surface condenser? Is the water that passes overboard from the hot well fresh or salt? A. The water circulated through the tubes and overboard is salt, but the water delivered by the air pump into the hot well should be fresh. 2. What is the principle of a keel condenser? After the exhaust goes into the keel pipes. does it turn into fresh water or does it take water from the sea? Does the air pump take it from the condenser to put it into a tank, then from the tank to the boiler? A. A keel condenser is a pipe outside of the vessel and generally run alongside of the keel to the stern post, and then returned again to the engine and connected to the air pump. The exhaust is into this pipe, and the water of condensation is fresh. It takes no salt water from the sea. 3. What is the principle of a jet condenser? A. In a jet condenser the water to condense the steam is admitted in a spray or jet, which is met by the exhaust steam. The water resulting is a little brackish, resulting from the mixing of the salt water to the condenser with the fresh water of the condensed steam.

(15) A. C. G. writes: 1. We have a boiler with a grate surface of 16 sq. feet, 40 flues 3 in. x 16 ft. What ought to be the size of the smoke stack? A. About 22 in. diameter. 2. What would be the theoretical result of a smoke stack one mile high? A. To reduce the draught. Any height beyond the point where the gases in the chimney are reduced to the temperature of the surrounding atmosphere would tend to reduce the draught.

(16) J. R. M. writes: In putting up a steam gauge, is it necessary to put a bend in the pipe? If so, what is it done for. Should water be allowed to remain in the pipe, or should the steam be allowed to act directly upon the gauge? A. A bend is given to the pipe for trapping the water, so that the water only has access to the gauge, and it is protected from the heat of the steam. The water acts directly upon the gauge, but should be drawn off in freezing weather when the boiler is not in use, otherwise it might freeze and injure the gauge.

(17) R. O. W. asks what deg as oil is, such as tanners use, also sod oil? A. Degras oil is a dressing for oil finished leather, such as calf and harness leather, and is used as a filler. It is imported and on sale by dealers in tannery supplies. The degrasis composed of the oil and alkali expressed in making oil dressed leather in Europe, where palm oil is principally used for this purpose. Sod oil is the oil and alkali expressed in the manufacture of oil dressed leather in this country, where fish oils are principally used. In each case their character has something more than that of the simple constituents. on account of their first use for dressing the raw skins.

(18) A. M. asks whether the glass coating described in our issue of August 26, 1882, page 130, will adhere as firmly to sheet iron forms as when applied by oxide. Can it be used with good results on sheet iron forms? A. The enamel stock as described is suitable for sheet iron dishes, that are so made as not to buckle or kink, the same as the porcelain glazed ironware, so much in vogue for kitchen use. We would not recommend it for large surfaces of sheet iron.

(19) P. S. asks how to hang a grindstone on its axle to keep it from wabbling from side to side? A. It requires a pretty fair mechanic to hang a grindstone to run true and stay true. It is supposed that you have no flanges upon the axle. The hole should be at least three-eighths or one-half inch larger than the axle, and both axle and hole square; then make double wedges for each of the four sides of the square, all alike and thin enough, so that one wedge from each side will reach clear through the hole. Drive the wedges from each side. If the hole through the stone is true, the wedges will tighten the stone true; if the hole is not at right angles to the plane of the stone, it must be made so, or the wedge corresponding must be altered in the taper to meet the irregularity in the hole.

(20) C. B. writes: If a tangential line should be extended from any point on the earth's surface into space, what would be the perpendicular distance between said line and the earth's surface at any given distance from the point of contact, say one mile or fifty miles? If this line were to be extended 4,000 miles, the perpendicular would seem to be 4,000 miles, *i. e.*, one-half the earth's diameter, but at one mile the perpendicular would not be one mile nor anything like it. What is the ratio of increment? A. For ordinary purposes the square of the distance in miles divided by the earth's diameter gives an approximate answer in parts of a mile. The following table is nearly correct:

Distance in miles.	Depression in feet.
1	0·667
2	2·669
3	6·006
4	10·677
6	24·024
8	42·709
10	66·733
12	96·095
14	130·796
16	170·836

(21) F. P. B. asks: 1. What is the best way of polishing tortoise shell? A. Having scraped the work perfectly smooth and level, rub it with very fine sand paper or Dutch rushes; repeat the rubbing with a bit of felt dipped in very finely powdered charcoal with water, and lastly with rotten stone or putty powder, and finished with a piece of soft wash leather, damped with a little sweet oil; or still better rub it with subnitrate of bismuth by the palm of the hand. 2. What is the way of joining or welding same? A. Provide a pair of pincers or tongs, constructed so as to reach four inches beyond the rivet; then have the tortoise shell filed clean to a lap joint, carefully observing that there is no grease about it. Wet the joint with water, apply the pincers hot, follow them with water, and the shell will be joined as if it were one piece. The heat must not be so great as to burn the shell, therefore try it first on a piece of white paper. 3. How can it be softened so as to force it into moulds? A. The softening of the shell is accomplished by heating it under water and then pressing it into moulds.

(22) S. M. T. writes: If a man should take a light but firm cylinder, 6 or 7 feet in diameter, and 2 or 3 feet deep—like a large shoal tub without a bottom—if he should set the cylinder up on one side, should stand up within it and walk or run, the cylinder would of course revolve around him. Now, could he thus drive the cylinder one mile more quickly than he could run the one mile on the ground, outside of the cylinder, and without using it? A. The man would have to run his mile to the greatest disadvantage. He not only would have to run the full mile, but would have to drive or push the weight of the cylinder, and also overcome the friction and pressure of the air against the cylinder, and would also have to run up hill. We think that he could make the mile quicker by drawing the cylinder after him.

(23) P. S. K. asks: 1. Is the gas that is in beer of the same nature as that produced in carbonated drinks? What is the difference, if any? A. The principal gas in both articles is carbon dioxide, or otherwise called carbonic acid gas. 2. What is the usual composition of good bell metal in making good church bells? A. The composition of bell metal varies; generally about 80 per cent copper and 20 per cent tin; small quantities of silver are sometimes added.

(24) U. H. P. writes: Please give composition of a metal that will cast easy and smooth in metal moulds, be white in color, be of right hardness to polish nicely, and will be easily electroplated with silver. Something suitable to make light ornaments of, yet not too soft to burnish the silver on, and to be as cheap or cheaper than brass, and more easily melted. A. The white alloy on page 312 of SCIENTIFIC AMERICAN for May 20, 1882, will probably be suitable for your wants, if not too expensive.

(25) H. U. writes: 1. I have a graphoscope lens 2¾ inches in diameter, 11½ sun focus; supposing it to be a single crown glass, what would be the diameter and focus of the flint glass, and distance between them for a dialytic telescope? I would like all the field view possible. A. The focus of your graphoscope lens is too short for its diameter, and is probably double convex, which is not the best form for a dialytic telescope. As a rule they are not a very good quality of glass. 2. How can I tell whether my lens is a crown glass or not A. You can tell if it is crown by its greenish shade of color by looking edgewise, or by its specific gravity, which should be from 2·45 to 2·80. 3. Would an achromatic object glass $1\frac{5}{16}$ in. diameter, 4 in. focus, do for a finder for a telescope 2½ in. diameter, 44 in. focus? If so, what would be the diameter and focus of the eye glass? If not, what glasses would I require? A. A concave flint of 7½ in. focus, 1⅜ in. diameter, placed about midway of the focus of the object glass, may give you better satisfaction than no glass at all. Your small object glass is good for a finder; use a plano-convex eye glass of ¾ in. focus, ½ in. diameter. One glass is sufficient.

(26) W. S. R. asks what article is used in the manufacture of paper wash basins and buckets to make it adhere together, and what would serve in the same capacity in pressing dry pulp into any shape? Also what would answer if wet pulp is used? A. The articles referred to are generally made by pulping straw, which when in suitable condition is properly moulded and pressed by means of hydraulic pressure into the desired forms.

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

D. G. McD.—This sample has the appearance of being a good fire clay, and if on analysis this opinion is sustained, the clay would be worth $4 to $5 per ton in New York. It would be well to submit it to a preliminary fire test and so examine its refractory power.—H. R.—Mica is found in all of the granitic, gneissoid, and schistose areas of this country. The mica is generally found in layers from 3 to 4 feet between various rocks. There are no means of determining the unexposed mineral. See "Mineral Resources of the United States," just issued by the Department of the Interior.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 25, 1883,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Acid or partly acid fatty bodies, treating, Bang & De Castro 290,835
Advertising fan, A. Wiehl 290,827
Air compressor, T. F. Freeman 290,764
Amalgamator, J. M. Thompson 290,815
Amber, manufacture of articles from waste, F. J. Kaldenberg 290,888
Auger bit, J. Swan 290,812
Axle box, car, P. Sweeney 291,006
Axle, car, F. P. Smith 290,938
Axle lubricator, car, Howard & Chance 290,987
Axle skeins, machine for forming, A. C. Emmick 290,982
Axle, wagon, S. R. Edney 290,760
Barrel lining, P. Uyrich 290,721
Belt shifter for elevators, automatic, F. W. Fuller 290,674
Bicycle seat, B. F. Peet 290,919
Bird cage sunshade, H. Bishop 290,838
Bit. See Auger bit. Bridle bit.
Blotter, Davis & Pyles 290,668
Board. See Electric switch board.
Boiler. See Steam boiler.
Boiler, A. P. Creque 290,667
Book cover, removable, J. M. Bronson 290,846
Boot or shoe, G. W. Gregory 290,986
Bottle stopper, J. M. Lewin 290,897
Box fastener, C. H. Ball 290,729
Box fastener, J. G. Leffingwell 290,992
Box or package, S. Van Campen 290,819
Bracket. See Wall bracket
Brake. See Vehicle brake.
Brick kiln, T. S. Smith 290,939
Brick molds, machine for sanding, W. Brower 290,736
Brick molds, machine for sanding, J. A. Buck 290,847
Bridle and halter, combined, White & Sheridan 290,826
Bridle bit, C. A. Chandler 290,859
Bridle bit, C. Scherling 290,808
Buckle, J. L. Thomson 290,816
Burial case, G. Nierstheimer 290,996
Burial casket fastener, Reynolds & Sander 290,931
Button fastening, Ivins & Snyder 290,774
Button fastenings, implement for setting, W. E. Hagan 290,680
Calendar, disc al, Freeman & Richardson 290,763
Can top, removable, C. J. Grainger 290,985
Car brake, automatic, H. S. Webster 290,723
Car brake, electro magnetic, R. Kampfe 290,689
Car, railway hand, J. C. Perkins 290,703
Car safety fender, P. H. Cooney 290,746
Car starter, True & Smith 290,720
Car step, H. S. Wolfe 290,957
Cars, ventilating, W. Scott 290,710
Carbon, W. C. Beckwith 290,886
Carbonating apparatus, W. J. Cunningham 290,749
Carding machine feeding mechanism, S. Driver 290,758
Carriage, child's C. Pfeffer 290,704
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Chain, C. G. Anderson 290,832
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Chain, roller, W. M. Patt 290,798
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Churn motor, O. E. Perry 290,799
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Cigar making apparatus, J. R. Williams 290,954
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