better adapt them to the condition of the wool on different sheep.

NECK YOKE ATTACHMENT.—Benjamin J. Sykes, Troutville, Pa. Three straps are included in this attachment. A holdback strap extending from the collar to the neck yoke, another strap extending from the neck yoke to the belly band, and a third strap extending from intermediate position on the belly band strap to the upper end of the holdback strap. The improvement is adapted for use with a breast strap or with a collar.

ANAL BOUGIE.—Franklin P. Stukey, Lancaster, Ohio. This is a device for mechanically reducing the inflammation and swelling in the treatment of hemorrhoids.

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 TELEPHONE SYSTEMS OF THE CONTINENT OF EUROPE. By A. R. Bennett. London and New York: Longmans, Green & Company. 1895. Pp. xiv, 436. 12mo, 169 illustrations. Price $4.50.

A painstaking work which should be in the hands of all who are interested in telephony. It includes statistics of the telephone services in twenty-six countries. It gives such information as the history and present position of the telephone in the various countries, the services rendered to the public, the tariffs, the exchanges, the switching arrangements, the hours of service, subscribers' instruments, payment of workmen and operators. The details of the various telephone systems though brief are of value, as the author was thoroughly acquainted with practical telephony, having served several companies as chief engineer. The statistics regarding the financial position of the various companies and their tariffs are particularly interesting in view of the recent discussion regarding the high telephone rates in the United States. The illustrations consist of views of exchanges and instruments, diagrams of switch boards, cross arms, insulators, etc. Great stress is laid on telephone exchange towers and turrets; most of these supports for wires are ugly, but a notable exception is the handsome dome of iron erected over the central post office at Stuttgart. It is capable of carrying 14,000 wires, the whole surface of the dome being covered with insulators. The effect, though a little startling at first, is on the whole very pleasing.


## SCIENTIFIC AMERICAN BUILDING EDITION.

**JULY, 1895.—(No. 117.)**

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1. An elegant plate in colors showing a residence at Bridgeport, Conn., recently erected for Christian M. Newman, Esq. Three perspective elevations and floor plans. Cost $5,500 complete. Architect, Mr. Samuel D. P. Williams, Williamsburg, N. Y.
2. A handsome residence at Glenwood, N. Y., recently erected for Wm. R. Innis, Esq. Two perspective elevations and floor plans. An attractive design.
3. A modern cottage of attractive design recently erected at New Rochelle, N. Y. Perspective elevation and floor plans. Estimated cost $3,000. Architect, C. B. J. Snyder, New York City. Design in the American order of architecture.
4. A summer cottage at Great Diamond Island, Me., recently erected for Edward L. Goding, Esq. Two perspective elevations and floor plans. Cost $2,500 complete. A picturesque design. Mr. A. Dorticos, architect.
5. An attractive dwelling at Oakwood, Staten Island, recently erected for Mrs. Margaret Dutche. Cost $3,800 complete. Two perspective elevations and floor plans. Architect, Mr. Herman Fritz, Jr., Passaic, N. J.
6. A Colonial dwelling at Springfield, Mass., erected for Messrs. J. D. and W. H. McKnight, at a cost of $6,000 complete. Two perspective elevations and floor plans. A pleasing design. Architect, Mr. G. Wood Taylor, Boston, Mass.
7. Colonial house recently erected at Groton, Mass., in the style of Longfellow's home. Perspective elevation and floor plans. Architects, Messrs. Child & De Goll, New York.
8. View of the Hotel Majestic, New York. One of the finest hotels in the world. Architect, Mr. Jacob Rothschild.
9. A cottage in the Colonial style, recently erected for Margaret Deland at Kennebunkport, Me. A picturesque design. Perspective elevation and floor plans. Mr. Henry P. Clark, Boston, Mass., architect.
10. Suggestions in corner decorations.
11. Miscellaneous contents: Hoop poles.—How to drive rats away alive.—Dumbwaiters and elevators, illustrated. — Saws. — Translucent fabric.—Improved spring hinges, illustrated.—Ventilated school wardrobes, illustrated.—Hanger for storm sash and screens, illustrated.—The hygienic refrigerator, illustrated.—Improved door hangers, illustrated.—Improved steam heater, illustrated. — Concrete roofs.—A trackless sliding door hanger, illustrated. —A first class hot water heater, illustrated.

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## Notes & Queries

### HINTS TO CORRESPONDENTS.

**Names and Address** must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.
**References** to former articles or answers should give date of paper and page or number of question.
**Inquiries** not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
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**Minerals** sent for examination should be distinctly marked or labeled.

(6572) L. J. W. writes: 1. I would be pleased to know what is the cost of a horse power, and what goes to constitute the cost? This I would require as a general average. Also what price is current in selling steam for horse power in engines at the usual conditions? A. The cost of steam power is very variable. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 429, on the cost of steam power. Prices vary from $1 to $1.50 per annum. 2. What is the relative value of an electrical horse power to boiler horse power? That is, I buy coal and I sell electricity, and I buy coal and sell horse power to an engine. A. The relative value of boiler horse power to electrical horse power varies with the economy of the engine, which varies with the amount of steam required to produce a horse power, say from 30 pounds to 12½ pounds, upon which about 80 per cent will be the electrical output of horse power. 3. What is the greatest amount of water evaporated per one square foot of heating surface in marine practice and under what draught? A. The evaporation in marine boilers varies somewhat, say 2½ to 3½ pounds per square foot of surface. Forced draught may increase the evaporation from 10 to 15 per cent. 4. What is the weight of iron per horse power in the usual run of marine boilers in racing craft and torpedo boats? A. There is a wide difference in the weight of the different types of boilers; as low as 40 pounds and all the way up to 200 pounds per indicated horse power of the engines is noted. 5. What is the horse power required to generate and make 100 tons of ice per day, evaporating water and pumping it also, with a modern improved plant? A. About 4 horse power more or less according to the nature of the process. 6. Can steam from large condensing engines after going through a grease extractor be used for making ice? A. No. 7. Are there any boilers in America being built and run with water tube exactly vertical and short for large horse power? A. None. 8. Is a water tube grate bar successful and economical? A. Not successful heretofore. 9. How many electric horse power can a 100 horse power engine develop? A. About 80 per cent of the indicated horse power of engine.

(6573) P. C. C. writes: Suppose there is a double railroad track where all the trains uniformly travel on one track going north, while the trains all uniformly travel on the other track going south. In such cases it has been observed by experienced railroad men that on the track where the trains travel north, one of the rails (east or west) is always worn more than the other; while on the track where the train moves south, the opposite rail (east or west) is uniformly worn more than the other. In each case which rail is it that wears more (inside or outside) and why? A. North and south railway tracks in northern and mid latitudes are radial to the earth's axis, as shown by the meridian lines on a polar map or globe. As cars move to the south at great speed they meet an increasing speed of the earth's surface, which forces the track against the west side of the train and wears the west rail. When running north the train is constantly meeting a decreased speed of the earth's surface, and having left and partaken of the higher speed of the earth's surface at the south, are thrown against the eastern rail, causing wear. 2. Is it safe for a lightning rod to come in contact with any part (especially those parts exposed to the weather) of a wooden building? A. It is safer to attach a lightning rod to the building than to use insulators, provided the ground connection is perfect or in thorough connection with moist earth. 3. Can a cheap battery be made without using either of the following: Zinc, copper, bluestone (cupri sulphate), carbon, and bichromate of potash? If so, how can I make it? A. There is no reliable battery made with cheaper material than you have stated.

(6574) A. S. De V. writes: Would you kindly inform a number of readers the theory of a cannon exploding while ramming home the load after it has once been shot. Also why holding the touch hole shut prevents an explosion, and also why the same is not necessary when loading a large pistol or muzzle-loading shot gun? A. Muzzle-loading cannon are loaded by pushing a powder cartridge or bag of powder to the breech, followed by the wad and ball. The bag, usually of flannel, is fired by the intense heat of the discharge and its rear end left in the gun. If air is allowed to reach any fragments of the bag that may not have been removed by swabbing, they may take fire and ignite the next cartridge. By closing the vent instantly after a discharge, air is prevented from entering the gun and the act of swabbing does not displace the product of combustion, mostly carbonic acid gas, which is a destroyer of combustion. The swab acting as a churn in the gas does not draw air in to set fire to any heated particles of combustible that might remain in the gun. In muzzle-loading shot guns and pistols the powder is poured in loose and is consumed and blown out at each discharge, so that there is nothing but the powder that could possibly remain, and the possibility of anything in the gun or pistol that would ignite a fresh charge is very small, yet premature explosions occasionally occur in quick firing of muzzle-loading arms.

(6575) W. T. B. writes: I am running a so-called 25 horse power engine, cylinder 10 inches diameter and 12 inches stroke, from a boiler of rated 15 horse power, 60 to 80 pounds pressure, nominal speed 150 revolutions per minute. I do not think that it uses steam economically. Would I get better results or more power by putting on a larger drum (present one is 36 inches diameter) and reducing speed to 120 or 100 revolutions per minute? A. The drum appears to be large enough. There is no economy in reducing the speed of the engine. The boiler appears to be too small for the economical generation of steam for the apparent power from the engine, and you may be wasting heat by the chimney from an overstrong fire and small boiler capacity. The throttle valve and cut-off plays an important part in the economy of running an engine. To be economical requires as full pressure at the steam chest as possible and the valve set to cut off at a point to give the power required. The governor should govern the speed, and the throttle valve should only be used as a contingent to over-pressure or extreme release of load. Without further facts as to the cut-off, kind and amount of work and the kind of boiler, we can only suggest that a larger and horizontal boiler be used, and an automatic governor operating the slide valve be adopted.

(6576) W. S. asks: 1. What size plate and how many of them would I have to use in a 60 cell storage battery to light three 110 volt 16 candle power lamps? The cells built like the Faure battery described in your June 21, 1881, issue. A. For the best results the plates should not be less than 7×10 inches, 13 or 15 plates per cell. To secure the 110 volts, the battery having two volts per cell, you will need $\frac{110}{2}$=55 cells for 1 lamp or any number up to the capacity of the battery. 2. Is the induced current in a transformer, using an alternating current in the primary, an alternating or direct current? A. Alternating current. 3. I cannot understand how Tesla produces a current alternating 100,000 times a second by the multipolar generator described in the "Life and Works of Tesla." Please explain. A. We cannot give a detailed description of Tesla's experiments. It is conceivable that 100,000 alternations per second could be secured by properly proportioning the number of elements in the machine and the number of revolutions.

(6577) M. McG. says: I see in your SUPPLEMENT, No. 397, August 11, 1883, on the subject of military ballooning, that a very light hydrogen gas was produced by passing steam over red hot iron, but it does not explain just how they did it. Can you give me the information? A. See the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 828, 849.

(6578) C. R. W. asks how the bottoms of trousers are cemented. A. Use thin sheet gutta percha, which can be purchased of the manufacturers especially for tailors' use. Place a piece of the tissue between the layers of cloth to be cemented and press with a hot iron. This causes the cloth to firmly adhere on account of the melting of the gutta percha.

(6579) H. A. McE. says: Can you give me some information regarding the beverage "perry"? A. A fermented liquid, prepared from pears in the same way as cider is from apples. The reduced pulp must not be allowed to remain long without being pressed. In the cask, perry does not bear changes of temperature so well as cider. It is therefore advisable, if at the end of the succeeding summer it be in sound condition, to bottle it, when it will keep perfectly well. The red, rough tasted sorts of pears are principally used for making perry. They should be quite ripe, without, however, approaching to mellowness or decay. The best perry contains about 9 percent of absolute alcohol; ordinary perry from 5 per cent to 7 per cent. Perry is a very pleasant tasted and wholesome liquid. When bottled champagne fashion, it is said to frequently pass for champagne without the fraud being suspected.

(6580) A. D. asks how to make buff wheels. A. Turn up the wooden disk to form the wheel on the mandrel on which it is to run. Cover the periphery of the wheel with good glue, prepared as for gluing wood, stretch the leather around and confine it with shoe pegs driven in about 2 inches apart. When dry turn off true with a sharp chisel. Give the leather a coat of glue and roll it in the emery, so as to make it retain it by being embedded in the glue. Let the wheel dry until the glue is hard and it is ready for use.

(6581) W. P. P. asks for a formula for carton pierre ornaments. A. The following is a formula for such a composition: Glue, previously dissolved in water, 13 parts; pulverized litharge, 4 parts; white lead, 8 parts; plaster of Paris, 1 part; very fine sawdust, 10 parts. Oil the moulds in which it is cast to prevent adhesion.


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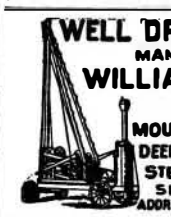

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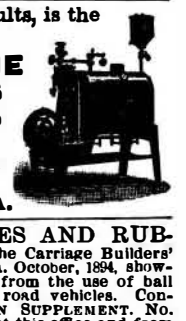

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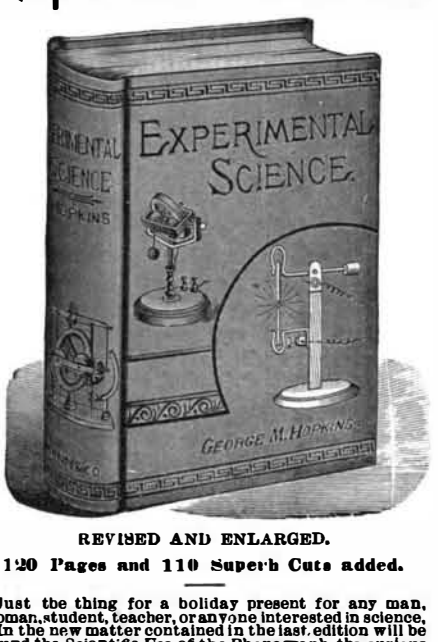


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