Grain Elevators in the Argentine Republic.

Consul Baker, of Buenos Ayres, reports that the elevator and grain deposit in that city, which goes by the name of the Buenos Ayres Central Produce Market, is a very large and imposing structure. The building covers an area of 47,000 square meters under roof and is three stories high, with capacity for the storage of 238,000 cubic meters. It fronts upon the Boca or Riachuelo port, with a fine dock along the landing. The total area of the premises embraces over 30 acres, or 127,478 square meters. Besides being a deposit, it is also a general market for all kinds of grain, wool, hides, and other varieties of the produce of the country. This market is not only a center for all the different railway companies, each one having its tracks running into the deposit, but it is also arranged, by separate entrances, to receive bullock carts coming with produce from the interior. Vessels for foreign ports are loaded directly from the elevator, and its machinery for handling grain is of the first order, the greater portion having been brought from the United States. This immense edifice, although already partially in use, is not yet completed, and its total cost, it is estimated, will be in the neighborhood of $5,000,000.

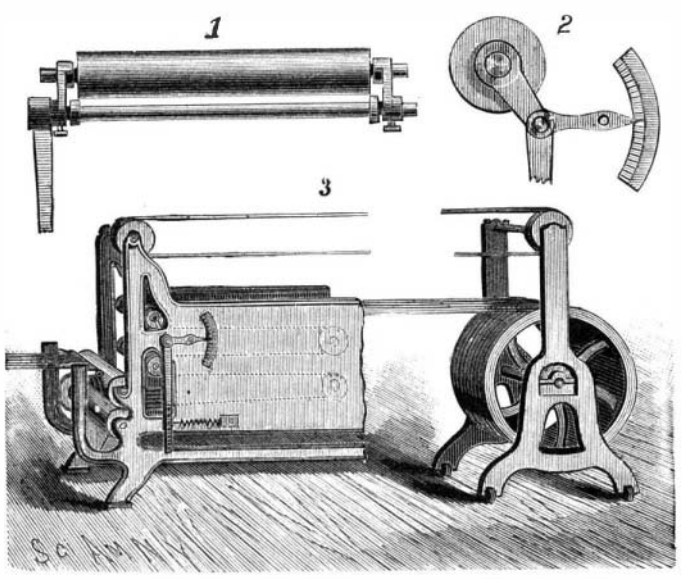
The elevator in Rosario, province of Santa Fe, is called the "Graneros de Rosario" (Rosario granary), and has been in operation several years. It is situated opposite the depots of the Central Argentine Railway, thus making it very convenient for handling grain arriving by that road from the richest agricultural districts of the province. It is eight stories in height, and in most of its details is constructed like many of the elevators of Chicago. Capacity upward of 300,000 bushels.

Besides this, there are now almost completed in Rosario an elevator for the Buenos Ayres and Rosario Railway and another for the Argentine Central Railway. The contractor for these is Mr. J. C. McLennan, of Chicago. The capacity of these is 250,000 bushels each. The machinery is all from the United States, and mostly furnished by the Buckeye Company, Salem, Ohio, and Poole & Hunt, of Baltimore. The cleaning apparatus is from Moline, Ill., the belting from the Boston Rubber Company, and the steam pumps from George Worthington, New York. They will each cost in the neighborhood of $300,000, and everything in connection with them is of the most modern style.

A TENSION INDICATOR FOR YARN DRESSERS.

The device shown in the accompanying illustration is designed to enable the operator to see at a glance how much tension is required on the winding reel. It has been patented by Mr. Thomas J. Sands, of No. 27 Orchard Street, Utica, N. Y.

A roller is mounted in bearings in arms secured by binding screws to an oscillating shaft, as shown in Fig. 1, the latter shaft being mounted in suitable bearings attached to the side frames of the yarn dresser. On one end of the oscillating shaft is a downwardly extending arm having at its outer end a series of apertures, to one of which is secured one end of a spring, attached by its other end to the side frame, as shown in Fig. 3, this arm having a pointer, shown also in Fig. 2, to indicate measurements on a graduated scale. The yarn dresser is in direct connection with the winder, and when the reel begins to take up the section of yarn, the yarn accumulating on the reel would ordinarily cause

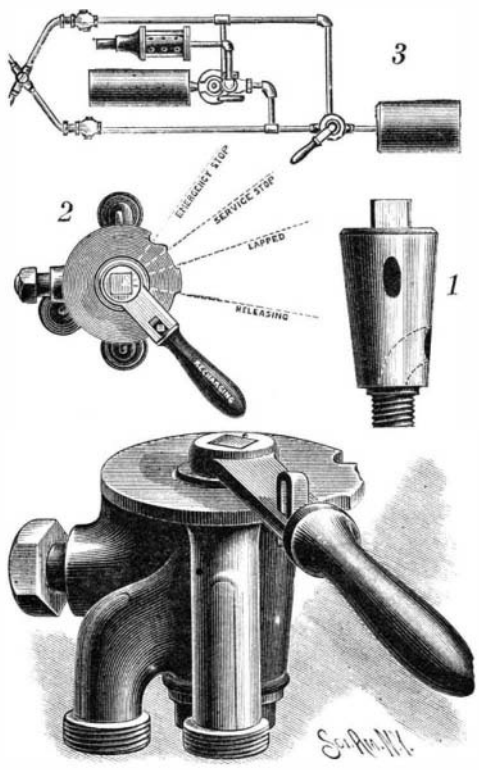


SANDS' TENSION INDICATOR FOR YARN DRESSERS.

the latter to tend to take up more yarn than would be delivered by the dresser, producing a strain on the yarn. This is avoided by adjusting the tension device on the belts operating the reel of the winder, causing the belts of the reel to slip as the diameter of the reel is increased, the slightest abnormal strain on the yarn in the direction toward the reel causing the roller to swing and the shaft supporting it to oscillate, whereby the pointer changes its position on the scale, and the operator can see at a glance how to adjust the tension to cause the roller to assume its natural position. This adjustment is effected by means of the spring in connection with the series of apertures on the arm extending downwardly from the oscillating shaft.

AN ENGINEER'S VALVE FOR AIR BRAKES.

A valve for automatic air brakes, designed to allow the recharging of the auxiliary reservoir under each car without releasing the brakes, and adapted to regu-



LEEMAN & JONES' VALVE FOR AIR BRAKES.

late the force of the brakes by releasing or reapplying at any time without fully releasing, is shown in the accompanying illustration, and has been patented by Messrs. Charles E. Leeman and Albert W. Jones, of Salida, Col. Fig. 1 is a side view of the valve plug, Fig. 2 being a plan view of the improvement applied, while Fig. 3 shows its application to the Westinghouse system. The valve body has opposite pipes connected with the main air reservoir and the train pipe respectively, with a third pipe also connected with the train pipe and with the exhaust opening of a triple valve, by which communication is established between the main air reservoir and an auxiliary reservoir. The valve plug has a transversely extending opening adapted to connect the inner end of the pipe from the main air reservoir with the upper end of the pipe connecting with the train pipe, and in the plug is also arranged an opening which leads from one side of the plug to the center and through its lower end to the outside. The latter opening has one side angular, with the other side curved, the angular side gradually permitting the air to escape, to prevent all jerks in applying the brakes. This opening is adapted to register with the pipe connected with the triple valve and with an extension of the pipe connected with the train pipe. When the operator desires to recharge the auxiliary reservoir, he moves the lever to the position shown in Fig. 2, moving it to the second position to release the brakes, and to "service stop" to apply them, etc. By the use of this valve it is designed to place the control of the brakes and train entirely in the hands of the engineer, without necessity for adjustment by the trainmen, to use as small or great amount of pressure as desired on the brakes of each car, while the brakes may be applied gradually without jerking of the train.

Experiments with Fibrous Plants.

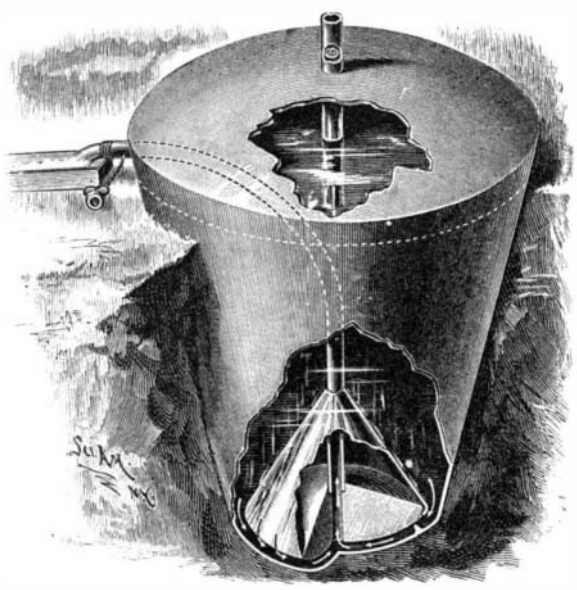
At London, in the Lambeth district, a factory in charge of Mr. Taylor Burrows has been started for the treatment of various kinds of fibrous plants. If the work prospers, textile manufacturers in all other countries must be greatly interested. There have been many attempts to substitute different fibers in the manufacture of textiles for silk or wool, and occasionally they have been successful, but oftener have failed, and this new factory has been established with a view to testing these sundry fiber-bearing plants by existing machinery and processes, and to discover wherein the treatment has hitherto been defective, and, if possible, to meet it.

A London journal writes of the new enterprise as follows:

"For want of time, money or knowledge, or of all three, a useful or even valuable addition to our stock of fibers may so far have been lost. Samples of fibrous plants of every species can now be submitted for carefully supervised trial, and if the present machines or processes prove unsuitable in some little detail or other, the defect will be discovered and remedied. In like manner advice will be given as to the best machines and methods of treating fibrous plants, and the opportunity will be afforded of studying the various processes of production and of acquiring a knowledge of the most scientific methods of preparing fibers. In fact, the present enterprise promises to develop into an important public technical school, for it is proposed to establish branches in textile manufacturing and cognate centers. The various processes to be carried out at the model fiber factory comprise the rapid retting and ungumming of fibrous plants; automatic breaking, scutching, combing and hackling; spinning into simple or mixed yarns; cottonizing and woolenizing fibers to imitate fine cotton or wool, suitable for the manufacture of various mixed and cheap fabrics, as well as for fine and costly goods; bleaching and dyeing the same, and the rapid drying of fibers by means of cold air. The factory consists of a spacious warehouse and storeroom for machines and samples, with offices annexed, and a large machinery and operating room, with a laboratory and an engine and boiler room. There is also a spinning machine in order to test the various fibers in this respect, and to see how they are likely to meet the requirements of a commercial article. Another important improvement is also being introduced at this factory, and that is the rapid retting of flax. The usual method of retting is to soak the flax in water for about three weeks. By the new process this will be effected in about a couple of hours. This quick action is brought about by submitting the flax to the influence of heat and moisture."—*Bradstreet's.*

AN IMPROVED CISTERN.

The accompanying illustration represents a cistern designed to be self-cleaning at each rainfall, and provides for the flowing off of the water from the bottom of the cistern as the fresh water enters at the top. It has been patented by Mr. Caleb S. Johnson, of Beaufort, S. C. The supply tube or rainwater pipe extends a short distance below the cover and is provided with a strainer, while through one side of the body, near the cover, is projected a curved tube to the lower end of which is secured a block having a vertical bore. A



JOHNSON'S CISTERN.

conical deflector is attached to the block and to the lower end of the curved tube, the block being supported by suitable feet upon the bottom, whereby a space is obtained for the reception of sediment. The deflector has apertures near its base and apex, intersections within governing the current thus produced, and is designed to cause any sediment in the water to pass downwardly in contact with its sides as it falls to the bottom, to be thence forced out upwardly through the central curved pipe when the cistern fills, or is to be flushed for cleansing purposes.

Steel Car Wheels.

The following test of steel car wheels made by the American Steel Car Wheel Co. took place recently at Boston, in the presence of several prominent railway superintendents: A 33 inch car wheel was placed on two solid iron blocks, rim resting on each block. A weight of 525 lb., falling at a height of 17 feet, struck the hub 25 times without any effect except battering the metal. It was then dropped 10 times on the rim without a fracture. Then a weight of 1,400 lb. was tried, falling at a height of 17 feet, struck the wheel 11 times, but failed to break it, showing it to be practically indestructible. At another exhibit, in order to test the expansion and contraction of the metal, a wheel was buried in sand and a charcoal fire built around the tread until it was brought to a red heat. Then it was taken out and exposed to the atmosphere, which had no effect on it whatever. This demonstrates that the wheel is a safe one. These wheels are in extensive service.

The "Medical Age" thus Defines Rest.

Rest is *repose*, or *inaction*, of a portion of the organism, during which the waste caused by the wear and tear of work is repaired—repose of a *portion* of the body, for during life we never find the whole at rest. From the time that the first blood globule begins to oscillate in the rudimentary blood vessel until the last sigh dies away in the stillness of eternity, there is no such thing as complete rest.

Human beings are so constituted that they cannot exercise all their faculties at one time. They stand on one foot and rest the other; listen with one ear and then the other; look with one eye while the other is loafing; walk until tired, and then sit down to rest; and when weary of an easy chair, get up and take a walk to "stretch the limbs." They talk until their tongues are tired, and then stop to think of what they will say next. So they go on throwing one set of wheels out of gear to let them cool off and get oiled up, while they set another portion of the machine running. Even in sleep, in which they come the nearest to complete rest, they are still hard at work. While the brain is standing almost still, the senses locked up, and the muscles relaxed, there are countless thousands of busy laborers at work, oiling up the whole machinery, replacing a worn-out cog here and there among the wheels, and sweeping out the dust and debris worn off by the friction of the machinery of this great manufactory of thoughts, words and deeds. When the day workmen stop, the night laborers go on duty, and some of the most skilled artisans are busy during sleep repairing the tissues.

The work that we do during the day with our heads and hands is what we get credit for; but when we rest and sleep, there is an important work going on. That branch of labor performed while we rest is unseen, and, for that matter, unknown by the majority of us, and hence is often neglected.

We are so constituted that the normal, healthful exercise of our faculties gives pleasure. It is pleasant exercise to eat when one is hungry; to rest when weary; to walk when the brain is fresh and clear. In fact, to do anything rational, when thoroughly prepared by previous rest, is agreeable. This is not only true of head and hand work, but also of the natural exercise of the feelings and emotions. When trouble comes, the feelings are wounded, relief is found in complaining and sorrow, and pain is washed away by tears. The Omnipotent set a limit also to human sorrow and suffering. These storms of affliction break over the healthy man or woman, and subside after a shower of tears and give place to the sunshine of hope and happiness. It is the weary and worn who cannot rise above their troubles, who go fretting and sighing in search of rest.

A well preserved nervous system can stand an occasional attack of righteous indignation in which considerable strong temper or passion may be manifested, if time is taken to fully cool off between the heats. It is the continual fretting, grumbling, and growling, without intervals of rest, that is wearing and injurious.

The law of harmony between work and rest, when fully obeyed, not only maintains strength, but develops it. All intelligent people know that fact, but many fail to think of it in such a way as to be governed by it. To exercise the muscles of the arms until they are tired and thoroughly rest them, and again exercise and rest, makes them grow stronger and bigger. So with the brain, it becomes stronger under well regulated exercise and rest.

Let us give a moment's attention to the various ways of resting.

First and most important of all, "Nature's sweet restorer, balmy sleep." Of all the ways of resting, this is the most complete and important. The time devoted thereto should not be regulated by hours so much as by the requirements of the individual. Some one, perhaps Franklin, said six hours for a woman, seven for a man, and eight for a fool. A little girl friend when told this, said, with much wisdom, "I like the fool's share." While admitting that some sleep too much, the majority get less than they need. Sleep should be taken with great regularity, and be free from all disturbance. Sleepless nights are often spent because of being too irritable from fatigue to rest.

One ought to stop work long enough before retiring to cool down to the sleeping point. Hunger, too, will chase away sleep. We would not recommend late suppers, but some easily digested food taken at bedtime, when needed, will often secure a sound night's sleep. We are told that "He gives His beloved ones sleep," and we know that there is much truth contained in this passage. The consciousness of being right and having done well is the best anodyne, the best sleep producer. There is none too much sleep for the righteous, but there is less rest for the wicked who violate the natural laws.

In addition to the good night's sleep, it is a good plan to take a short nap in the middle of the day. It divides the working time, gives the nervous system a fresh hold on life, and enables one to more than make up for the time so occupied. It is well to guard against too long a sleep at such times, since such is apt to produce disagreeable relaxation. There has been much discussion regarding the after-dinner nap, many believing it to be injurious, but it is nevertheless natural and wholesome.

Much can be accomplished in the way of resting, short of sleep. It is very important to economize the opportunities for rest during working hours in the day. The great principle which underlies daily rest is relieving of one portion of the organization from duty while the others are at work. This can be done to a great extent. When the muscles are tired and worn from mechanical work which requires but little attention of the brain, stop motion and set the brain at work. The laborer can read, think, and speak while his weary limbs are at rest. His brain need not be idle because the hammer or chisel has dropped from his weary hand. On the other hand, a man can work with his hands when his head is tired. The bookkeeper whose head is weary with business facts and figures by five o'clock in the afternoon has considerable time in the evening to sing, play, dance, dig in the garden, or black his boots, all or either of which he may do while his head is partially at rest. There is another very important way of obtaining rest mentally, that is by changing from one occupation to another. The dexterous gold beater when he finds one arm getting tired takes the hammer in the other; and so may the man who hammers thoughts out of his brain exercise one set of mental functions while the others are at rest. One may read until tired, and then write; may acquire knowledge until weary, and then teach to others.

R. S. V. P.

"I always make it a point," remarked a manufacturer to a representative of *Age of Steel*, "to reply to every communication of a business nature addressed to me. It doesn't matter what it is about, provided only that it is couched in civil language. I do this because courtesy requires that I should; but aside from that, I find also that it is good policy. Time and again in my life I have been reminded by newly secured customers that I was remembered through correspondence opened with me years before, and many orders have come to me through this passing and friendly acquaintance with people. On the other hand, I have known plenty of business men whose disrespectful treatment of correspondents has been bitterly remembered and repaid with compound interest. Silence is the meanest and most contemptuous way of treating anybody who wishes to be heard and to hear, and resentment is its answer every time."

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.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(2505) Reader asks (1) for a formula for taking greasy spots out of clothing without injury to the cloth. A. Use benzine or chloroform. Apply it with a sponge in a circle all around the spot, then apply more until the spot is reached, when you must sponge it off thoroughly. 2. What is a good glue for mending broken dishes? A. Try cement as below or using the whey from one-half pint of milk curdled with vinegar. Mix with it the white of an egg and pulverized quicklime. After applying, dry in the air and then over a fire. 3. What are the ingredients of artificial honey? A. Soft water 6 pounds, pure best honey 3 pounds, white sugar 20 pounds, cream of tartar 80 grains, essence of roses 24 drops. After 5 minutes' boiling take from fire and add the well beaten whites of 2 eggs, and when it is nearly cold add two pounds more of honey. Sometimes a decoction of slippery elm bark is added, but it is liable to cause fermentation in hot weather.

(2506) C. F. C. H. asks for the formula for cementing meerschaum. A. Dissolve caseine in a solution of water glass (silicate of soda) and stir into it calcined magnesia and use at once. Caseine is prepared by allowing perfectly skimmed milk to stand until it curdles, when the caseine is filtered out and washed on the filter. To simplify above a little fresh cheese may be boiled in water and mixed with slaked lime and ashes, using 10 parts cheese, 20 parts water 2½ parts lime and two parts wood ashes.

(2507) J. T. N. writes: 1. Will you give receipt for laundry starch? A. We refer you for laundry work to the SCIENTIFIC AMERICAN, Vol. 62, No. 9. 2. A receipt for laundry blue, dye or liquid forms. A. Solid bluing formerly consisted of a mixture of indigo and starch. At present artificial ultramarine is largely used. Liquid bluing may be made by dissolving 1 ounce of soft powdered Prussian blue in 1 quart rain water in which ¼ ounce oxalic acid has been dissolved. A teaspoonful is enough for a large washing of clothes. 3. Name a good book on flavoring extracts. A. For information on flavoring extracts we can supply you with "A Treatise on Beverages," by Sulz, price $10, which contains information on the above named subject. 4. And one on perfumes. A. We can supply you with "A Comprehensive Treatise on Perfumery," containing a history of perfumes, by Cristiani. Price $5.

(2508) R. S. asks (1) how to make prepared flour. A. For every 4 pounds of flour add ½ ounce each of baking soda and tartaric acid. 2. Whether it can be mixed without going to the expense of buying machinery for the purpose of mixing same. A. It is a question of mixing. It must be most thoroughly and perfectly mixed. Add the chemicals separately and in small portions distributed through the flour, and pass the whole through sieves to insure mixing.

(2509) D. S. McK. asks (1) how water color paint is made (red, blue, and green), the kind flour barrel heads are painted with. A. The colors may be mixed with weak size, or an oil paint thinned with turpentine may be used. 2. How phosphorescent paint is made, *i. e.*, the kind that shows a sort of a light in the night (often found on match safes). A. You refer to Balmain's luminous paint. Papers on its use, preparation, etc., will be found in our SUPPLEMENT, Nos. 229 and 249. 3. What form will compressed air assume when it is pumped into an air-tight vessel? Does it become warmer or cooler, and does it hold its warmth or coldness for any length of time? A. It becomes warmer, but soon loses its heat by conduction through radiation from the sides of the receiver.

(2510) C. N. V. asks: In burning rock for hydraulic cement, with soft coal, what proportions of rock and coal are used? Are the rock and coal put in the kiln in layers or mixed together? A. The burning of cement rock is referred to in Gillmore's "Limes, Hydraulic Cements and Mortars," page 127. 3,500 pounds of anthracite he states is sufficient to produce 30,000 pounds of cement. The fuel and stone are placed in layers, the stone not exceeding a thickness of 6 inches. Bituminous coal will not vary greatly in results from anthracite.

(2511) J. H. N. asks: 1. How many cubic feet of gas can be produced from 50 pounds of dry oak wood and from 50 pounds coal (the kind used ordinarily under steam boilers)? A. About 225 cubic feet in each case. 2. Which gas is of most value for heat purposes? A. The coal gas.

(2512) J. H. P. asks (1) how long a patent holds good in the United States without renewal. A. 17 years. 2. Whose work on electric lighting and power you would recommend for a person having slight experience, on wiring and care of dynamos? A. We refer you to our catalogue of electrical books sent on application.

(2513) J. W. T. asks: What paint or other substance, resinous or mucilaginous, will withstand the action of ammonia for a protracted period, that is, will serve as a coating or packing for uniting a valve and its seat, and which will be readily separable at a moderate pressure, and without regard to the time in which the device containing the ammonia may remain undisturbed? A. Ourbest suggestion is for you to try a solution of gutta percha in bisulphide of carbon.

(2514) W. D. T. asks if there is any known way to electroplate iron? A. Regular electroplating processes are used for iron. It is necessary to give it a thin deposit of copper before silvering. The same is advisable before nickel plating. Steel knives are silver or nickel plated in great quantities, and many other iron or steel articles are electroplated.

(2515) M. F. W. asks (1) how to clean deer horns without polishing them with sand paper. A. Use a soft woolen cloth and ground pumice stone and water. 2. What is the best blacking for boiler fronts? I have been using asphalt, and it scales off after a week or two. A. If in good condition, use stove polish or simply wipe off from time to time with greasy waste.

(2516) J. R. J. asks for the best and cheapest receipt to make the commercial acetate of chrome, 30° B. A. It is simply made by mixing together solutions of lead acetate and of chrome alum or of sulphate of chromium. Of the salts there are required for 250 parts chrome alum or for 98·2 parts chromium sulphate (dry) 284 parts lead acetate. By evaporating or adding water its strength may be adjusted. The chromium sulphate gives the finer product.

(2517) C. H. K. & E. W. D.—Typewriter copying ink may be made from aniline colors dissolved in alcohol and added to glycerine. Dilute with water and apply to the ribbon. Castor oil may be used instead of glycerine.

(2518) C. H. M. writes: What is the ordinary or mean cost in this country of one electric horse power per hour or per day, where coal is used as a fuel, and the elastic current is generated by a steam engine running a dynamo? When we are told that it requires so many electric horse power per hour to effect a given purpose we would like to know, approximately at least, what this represents in cost. A. Any specific estimate would be for most cases misleading. It would vary not only with the cost of coal and of labor, but also with the size of the works. The larger the works the lower would be the cost of generating power. The following data give a basis for estimates. Fuel consumed per horse power of boilers per hour, 2 to 5 pounds, loss on generating dynamo 10 per cent, loss on customer's motor 10 per cent, loss in transmission variable from 1 per cent upward. Labor the same as for any steam plant of similar size. Superintendence variable.

(2519) O. A. K. asks for the principle by which the true per cent of proof spirits is calculated, having given the indication of the hydrometer and the temperature. For example: Say the hydrometer shows indication to be 110 and the thermometer indicates temperature of 82°, what is the true per cent of the spirits and how calculated? A. The direct readings of the hydrometer you speak of refer to proof spirits. A mixture of 50 parts alcohol and 53·71 parts water contracts on mixing and the resulting liquid contains one-half its volume of alcohol. This is proof spirits, *i. e.* spirit containing 100 per cent of proof spirit. If the hydrometer reads 110, the spirit is 10 over proof or is equal to 110 per cent of proof spirit, or about 55 per cent of pure alcohol. The temperature has to be allowed for and corrections applied by tables, issued with full instructions and explanations by the United States Treasury Department. If you will test your spirits at 60° Fah., no correction is necessary, and the direct reading may be taken as above.

(2520) J. H. H. asks how the Archimedian screw is constructed—the diameter of the tube, the diameter of the cylinder about which the tube is coiled, and at what angle the screw must be placed to insure successful operation. A. It may be made by winding a tube around a cylinder or by dividing a hollow cylinder by a helicoidal partition. Taking the case of the cylinder, the element or line drawn from the center of a convolution through the axis to the center of the opposite lower convolution determines the working angle. The screw must be placed at such an inclination that this line will be a little inclined to the horizon, the end corresponding to the highest convolution of the screw being lower than the other. They are used at an angle of 45° to 60°. In our SUPPLEMENT, No. 596, you will find an example of their use in practice.

(2521) W. M. C., Nantucket, says: There is a valley on the outskirts of the town where, by putting one's ear to the ground, a noise is heard like the cooper's hammer, as he drives a hoop on a cask. I can trace it back over a hundred years. It can be heard only in that spot. Can you tell me the reason and do you know of a similar case? A. It is probably an acoustic effect like the roar of the sea in a conch shell. Possibly akin to the singing sands, which make a noise by the blowing of the wind.

(2522) H. H. H. asks: Does sound exist independent of the sense of hearing? Will a lump of iron, if dropped in the ocean where it is six or eight miles deep, sink clear to the bottom, or will it, at some great depth, remain stationary? A. Sound, as we understand it, does not exist independently of our ability to hear. It is caused by vibration which may exist in all conditions and intensities, but is not realized as sound until recognized through the organs of hearing. The lump of iron will sink to the bottom of the sea at all depths.

(2523) S. V. F. asks: A man buys twenty pencils for twenty cents. The prices are two for a cent, four for a cent, and four cents each. How many of each did he get? A. This problem can be done easily by using two simultaneous equations each of three unknown quantities and by tentatively assigning values to one quantity, determining the others. The answer is three pencils at 4 cents, two at four for a cent and fifteen at two for a cent. The equations are $x+y+z=20$ and $4x+\frac{1}{4}y+\frac{1}{4}z=20$. Possible values of x are 1, 2, 3, and 4—to be used tentatively.

(2524) C. H. L.—For removing ink, a mixture of tartaric and oxalic acids is often used. Javelle water is also of use for some cases.