What and why is it? A. The paper breaks what may be termed the magnetic circuit. 8. How can wood be seasoned? A. By drying. 9. Why do they use an induction coil in the telephone instead of a direct current? I should think it would be unprofitable on account of the resistance. A. To avoid the necessity for heavy lines for conductors.

(2226) A. T. O. writes: 1. I have a solid flame gas furnace. Is it a good thing to use in heating tool steel for forging and tempering? A. Yes, if the temperature is high enough. 2. What is the caustic potash and iron battery of which I have heard favorable mention lately? A. Negative element iron, positive element zinc, depolarizer oxide of copper, resting on the iron plate, exciting liquid caustic soda, or caustic potash in solution, E. M. F. 0·7 to 0·9 volt. Resistance very low, current very constant. 3. A ton of water falling 10 feet will do 20,000 foot pounds of work. Now, I maintain that if it be allowed to do its work by falling through that distance, it is immaterial whether it does it through the medium of an overshot or a turbine wheel, provided friction be left out of account, and, in the case of the overshot, that none of the water be discharged from the buckets until it reaches the lower level. Am I right? A. It is immaterial. On the whole perhaps the overshot type of wheel has given the highest efficiency, though turbines have in some instances given about as good results. A loss of from 10 to 30 per cent is to be anticipated.

(2227) L. H. asks: How many gallons of water can be evaporated with a ton of coal? Does salt water evaporate as fast as fresh, under similar conditions, and if not, explain difference? What is the best known process for evaporating water for making salt where coal is used as a fuel, and where can I get information as to the cost of same? A. The evaporation power of a ton of bituminous coal is equal to about 3,000 gallons of water in open pans, with economical firing. As saturated brine boils at 227° Fah., instead of 212° for fresh water, the evaporation effect of a ton of coal will be somewhat less for making salt. By the regenerative process of utilizing the heat of the vapor of evaporation for heating and concentrating the incoming brine, it is claimed that a much greater evaporation effect is produced per pound of coal, a possibility of nearly 15 pounds of water per pound of coal. By addressing the Secretaries of State of New York and Michigan you may obtain the reports on the salt industry of these States.

(2228) W. D. M. asks: 1. What is the E. M. F. of Fuller's battery? A. About 2 volts. 2. How long will 10 or 12 Fullers run, using them about four to six hours a day? A. It depends on the amount of work done. Probably 4 or 5 days. 3. How many 2 quart Bunsen battery cells will it take to run the simple electric motor, and how many days will they run the motor at six hours a day? A. It will take 12 cells, connected 6 in parallel and 2 in series. 4. Will wrought iron do to wind the field magnet on? A. Yes. 5. Can I use wrought iron for the core of the armature? A. It is not as good as the wire. 6. Can I use insulated iron wire No. 19 to wind the core of the armature? A. Yes. 7. What number of wire should be used for the winding of armature and field magnet? A. No. 18. 8. How many revolutions will it make a minute? A. About 2,500. 9. What fraction of a horse power is it? A. One-eighth to one-tenth.

(2229) J. B. P. asks: Why does a tree grow round and not square or any other shape? A. There is nothing in nature on the square, except the forms of some crystalline minerals. A circle is the shortest way around, and as trees grow from a common center, a circle becomes a natural sequence in their outward form.

(2230) E. H. asks: Is there any agent known which will restore the ductility of sheet iron, which has been annealed, otherwise than rolling? A. Rolling or hammering is the only way of hardening zinc. Its toughness cannot be restored except by rolling at the proper temperature.

(2231) O. P. Q. asks for a rule to find the horse power to hoist a given load from a coal shaft in a given time. Say 2,500 pounds 400 feet in one minute. A. Multiply the load in pounds by the height in feet per minute and divide the product by 33,000. Thus: $\frac{2500\times400}{33000}$ = 30 horse power, to which must be added the friction of engine and hoisting gear.

(2232) G. W. T. asks: What is the difference in amount of yearly evaporation between one acre of grass land, one acre of plowed land, and one acre of water? A. The difference between the amount of evaporation on water, plowed land, and grass is very uncertain, depending upon the supply of water in the soil, a dry soil evaporating much less than a wet soil under plowed ground. On the average, evaporation on water is greatest, amounting to about 0·08 of a pound per square foot per hour at a temperature of 50° in a light breeze. Plowed ground less, and grass more or less, according to condition of soil beneath. The river basins of the northeastern part of the United States and Western Europe evaporate about one-half the total rainfall, while the great basins of the Amazon and the Mississippi evaporate four-fifths of the total rainfall. The entire Nile basin evaporates about 96 per cent of the total rainfall. The evaporation from the whole land surface of the world gives an average of about 75 per cent of the total rainfall upon the land.

(2233) W. E. F.—The bird is the Bohemian waxwing (*Ampelis garrulus L.*) Habitat North America, U. S. "Casually in winter, but sometimes appearing in immense roving flocks south, sometimes to 35°" (Coues); also "Northerly hemisphere, northerly, wandering south in vast troops at irregular periods. In America, south, regularly in winter to the northern tier of States, in the Rocky Mountains much further, casually to about 35°. Rare on the Pacific coast except in Alaska. Breeds in high latitudes, but down to the United States border in the Rocky Mountains nests in trees or bushes in the crotch of a bough or saddled on a limb" (Coues). Eggs larger than those of the cedar waxwing. Your other queries will be answered later.

(2234) C. H. V. asks: What will make linen paper soft and limber, other than by immersion in weak sulphuric acid bath? A. Boiling water tends to produce the desired effect; caustic alkali in solution or a strong solution of chloride of zinc may be tried. It is not easy to suggest anything that will effect the purpose without injury to the fiber.

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