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O. K. will find descriptions of wire rope transportation on p. 370, vol. 31.-H. D. will find formulas for calculating the friction of water in pipes on p. 48, vol. 29.-J. D. will find full instructions for making acetic acid on p. 58, vol. 30, p. 75, vol. 31, and p. 106, vol. 32.—J. will find directions for getting rid of flesh worms on p. 233, vol. 31.— H. W. should consult a physician.-C. F. B. will find a recipe for birdlime on p. 347, vol. 28.—G. P. D. will find a recipe for blue black ink on p. 42, vol. 33.-P. E. D. will find a description of a pantagraph on pp. 99, 179, vol. 28.-M. J. W. will find di-rections for filling walnut wood on p. 315, vol. 30 -B. W. will find directions for grinding and polishing glass specula on p. 276, vol. 30.-C. D. A. can mold rubber by the process described on p. 283, vol. 29.—L. G. G. will find a recipe for filling for fireproof safes on p. 75, vol. 32.—A. M. can preserve specimens of fruit by the process described on p. 42, vol. 33.-C. G. C. will find a description of the phosphorus lamp on p. 10, vol. 27.-J. O. R. will ind directions for making potato starch on p. 315, vol. 31.—H. T. W. will find a recipe for a cement for glass on p. 379, vol. 31.-G. W. I. will find directions for obtaining sulphur from the ore on p. 295, vol. 31.-J. H. L. will find directions for cementing cellar floors on p. 50, vol. 32.-W. G. O. fanchester, N. H. Bolt Headers (both power and foot) and Power vol. 30.—G. S. can make mica varnish by follow-

method, exhausting them of all grease, etc., by means of bisulphide of carbon. The bones are then thrown into a large retort and subjected to destructive distillation. At first there passes over a large quantity of a fetid gaseous matter, accompanied by a considerable quantity of carbonate of ammonia, and other volatile alkalies. formed on the type of ammonia. These gases and sublimates are passed through a large washer, which retains the ammonia and other salts accompanying the gas; after which the latter is conducted into the farnace and burned beneath the retort. As the distillation proceeds, a quantity of tarry matter and oil comes over. After the operation is finished, the residue remaining in the retort constitutes the animal charcoal. The washing apparatus may consist of a large iron tank, half filled with water, and having a tightly fitting cup through which two pipes pass, one of whick -the one leading immediately from the retort-passes down below the surface of the water. The gas, in its passage from the retort, is thus caused to bubble up through the water, and thence it is conveyed by the sec ond pipe into the furnace, where it is burned. The water in the washer may be used several times, or until it becomes nearly saturated with the salts; it should then be drawn off through faucets ar-

ranged in the side of the tank, and the salts crys-talized out by evaporation, dried, and prepared for market. The tar and oily water remaining in the tank, which are used for the preparation of lamp black, may be drawn off in like manner.

(3) T. B. asks: Is it best to go to college and perfect oneself in architectural science, or enter an office at once, after graduating at an academy? There is a special course of architecture laid out at the college. A. Enter as a student into the office of an architect of large practice. where there is an extensive library of architectural and scientific works.

(4) T. P. asks: What is the cause of the fetid smell of perspiration, and is there any permanent cure for it? A. Do not try to prevent perspiration. It is one of the requirements of a healthy body. Closing up the pores of the skin by the use of certain washes or powders to prevent excessive perspiration is a dangerous experiment. "The perspiratory glands of the skin are scattered everywhere throughout the integument, being most abundant on the anterior portions of the body. They consist each of a slender tube, about $\frac{1}{400}$ of an inch in diameter, lined with glandular epithelium, which penetrates nearly through the entire thickness of the skin, and terminates below in a globular coil, very similar in appearance to that of the ceruminous glands of the ear. These glands are very abundant in some parts. On the posterior portion of the trunk, the cheeks, and the skin of the thigh and leg, there are, according to Krause, about 500 to the square inch : on the anterior part of the trunk, the forehead, the fore arm, and the back of the hand and foot, 1,000 to the square inch : and on the sole of the foot and palm of the hand about 2,700 in the same space. The whole number of perspiratory glands is not less less than 2,300,000, and the length of each tubular coil, when unraveled, about $\frac{1}{15}$ of an inch. The entire length must be not less than 153,000 inches, or about two miles and a half. The fiuid derived from this extensive apparatus is the perspiration. It is a clear, colorless, watery liquid, with a distinct acid reaction. Its constitution is as follows Water 995'00, chloride of sodium 2:23, chloride of potassium 0.24, sulphate of soda and potassa 0.01, salts of organic acids with soda and potassa 2.02. Total, 1,000.00."-Dalton.

(5) F. L. B -The scheme which you suggest for a convention of inventors, to be held during the Centennial year, is theoretically good; but such meetings have been proposed before, and whenever they have been held they have resulted in no practical benefit.

(6) O. W. I. says: I have a galvanic battery of my own construction; and as I do not under stand the process of putting it in running order, I ask your advice as to charging the battery. It is composed of two zinc plates and one copper plate, and I want to ascertain the right amount of vitriol to be used. A. Use 1 part oil of vitriol and 15 parts water.

(7) W. N. W. asks: How can muslin be made waterproof without materially changing its color, or injuring its pliability? A. We know of nothing that will satisfactorily answer all your requirements.

(8) S. & C. say: We raised from the grave a few weeks ago the body of a man who had been buried 15 years, in a well cemented metallic coffin; and on removing the iron plate over the glass, we could see on the inside of the coffin (with the corpse) two living common house flies. The body was in a good state of preservation, and there was of course no opening in the coffin to admit the flies. How did they get in? A. We can give no explanation.

power of a machine, if a spring were substituted for the weight, would not an increase of velocity affect the spring more? A. No. 3. Will a spiral spring be contorted or twisted more if it runsat a high than at a low speed? A. Yes. 4. Will a spring of steel or brass, working in steam of ordinary heat, lose its elasticity? A. Yes, in course of time.

(12) Y. E. says: 1. I have built an engine, 1½ by 3 inches, and I want a light and strong boiler for it. Would a piece of 10 or 12 inch boiler flue, ay 2 feet long, do to make a plain cylinder boiler of? A. Such a boiler as you speak of might an-swer, but you would not obtain very good results. 2. How can I make a furnace around it? A. The boiler must be set either in brick or some other suitable material, with the furnace beneath. 3. Would such an engine and boiler be large enough to propel a boat with stern wheel, said boat to be large enough to accommodate 4 or 5 persons? A. You do not give sufficient data. 4. Are ports 1/3x 1/2 inch large enough for a 11/2 by 3 engine? A.The ports will answer, but it would be no harm to have them a little larger.

(13) J. G. L. says: I had an anvil of cast iron, 7 inches wide, 12 inches long, and 10 inches high, and tried to put a chilled face on it. The chill was 31% inches thick, and the face would not harden, remaining as soft as common iron. What was the cause of it? A. It was due to the quality of the iron.

(14) C. T. A. says: 1. If air is taken at atospheric pressure and at any given temperature, and is compressed to anygiven pressure persquare inch, what would be the resultant temperature? The following formulas are applicable to such cases, provided there is no loss of heat by radiation or conduction: T=absolute temperature of air before compression; t=absolute temperature of air after compression; V=volume of air before compression; v=volume of air after compression; P=pressure of air before compression; p=pressure of air after compression. Then $\frac{t}{T} = \left(\frac{V}{v}\right)^{0.403} =$

 $\left(\frac{p}{P}\right)^{0.29}$. This equation can be most readily solved

by the use of logarithms, thus: $\log \left(\frac{t}{T}\right) = 0.408 \times \log \left(\frac{V}{v}\right) = 0.29 \times \log \left(\frac{p}{P}\right)$ 2. Does the pressure increase as the volume decreases? A. Yes.

(15) H. C. J. asks: 1. Will water coming with force through a large pipe have power to empty a waste water chamber at lower end of small tube placed concentrically with the large one? A. Yes, under certain conditions. That is, the force of the current through the large pipe must be graduated to the length of the small pipe. Would the effect be assisted by making perforations below the nozzle of the small pipe to admit jets of water and force out air or water? A. No, this is unnecessary.

(16) J. L. asks: What is the best work on wmills? A. There is no work that we know of devoted entirely to sawmill management. Any standard work on millwork will assist you, so that, with practical workmanship, you will be enabled to build any kind of a mill.

(17) J.C.L. says: I wish to color a shingle roof red, so as to resemble red slate. If I paint it, [am assured, the shingles will rot very soon, as the moisture that is drawn up by capillary attraction between the shingles will be prevented from escaping by the paint. Is there any wash, of the proper color and not more expensive than white lead paint, that will not be washed off by rain, and yet will allow the water absorbed by the shingles to dry out? A. Lime wash will preserve the shingles and can be colored any tint you desire by mixing dry color with it.

1. What causes the closet in which I keep woolen blankets to turn black? It is painted with white lead. A. The presence of light is more or less necessary to preserve the purity of white paint. But in your case the discoloration may arise from the escape of gas, either from a gas pipe or an ordinary waste pipe. 2. If I paint the aforesaid closet with white zinc, will the difficulty be remedied? A. It is not likely that it will.

(18) G.W. asks: Is there a substance which will intercept magnetic force when placed between the magnet and armature? A. No.

(19) G.R.McK. says: 1. 1 wish to face a mill dam, 20 feet high, above and below with rough stone and brick, connecting the two faces with a tube of iron or brick through which the water will pass to the wheel. The abutment of the walls are to be 1 foot thick. How thick should the abutments be at the base to withstand the pressure of the earth between them? A. Six feet. 2. Would ime water answer to lay the stone in and plaster the faces exposed to the water with cement? A. No; cement should be used in the wall. (20) L. W. H. asks: Will a double belt convey more power than a single one, and, if so, in what proportion? A. Yes, other things being equal.

Scientific American.

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Foot Lathes-Wm. E. Lewis, Cleveland, Ohio.

ing the directions on p. 241, vol. 32.-J. E. W. should consult a physician.—N. B. W. should consult the "Text Book of Metals," by Bloxam.-E. A. R. will find a full description of the motion of a

crank on p. 112, vol. 31.-J. J. R. can cement leather to rubber by using the preparation described on p. 119, vol. 28.-H. G. M. will find directions for tempering small steel articles on p. 235, vol. 32.-E. B. L. will find a recipe for fine blacking on p. 45, vol. 31. The proper length of a spring can be properly settled by experiment only.-E. J. can clean silver articles by the method described on p. 129, vol. 28.-N. E. B. should consult a physician. -J. L. B. will find full directions for hardening files on p. 212, vol. 26.-J. T. T. will find a recipe for bronzing on brass on p. 283, vol. 31.-C. A. P.G. will find a recipe for pomade on p. 347, vol. 32.

(1) R. B. asks: Can you tell me how to take broken glass stoppers out of bottles? A. Warm the neck of the bottle in a gas flame.

(2) C. H. asks: How can I make bone black suitable for sugar refiners' use? A. In the preparation of bone black, the bones are first boiled in water to remove all the adhering grease (which is otherwise utilized), or, what is perhaps a better both taken into account to decide, by friction, the mensuration of earthwork.

(9) O. R. says: It is claimed that a spark will cause gunpowder to explode, but that a fiame will not. I claim that, by blowing a fiame on it, gunpowder will be exploded. Which is right? A The action of either a flame or spark upon gunpowder is to cause a slight decomposition of the saltpeter, and at the same time to ignite the combustible carbon and sulphur, which burn at the expense of the oxygen of the saltpeter.

(10) N. & G. ask: Is there such a thing as a magnetic rod, needle, or compass that will be attracted by gold or silver? A. The magnetic properties of these metals yet remain to be discov The so-called divining rod has never existed. It is a common way of imposing on the credulous.

(11) J. D. W. asks: 1. Is it true that the friction of a wheel or shaft does not increase with velocity, but only with pressure? A. Yes. 2. In a dynamometer, in which weight and speed are

(21) J. S. says: I have a large hollow apple tree which has been filled with large black ants for the last three or four years. How can I getrid of them? A. Try the application to the inside of the tree of a weak solution of chloride of lime. This may be applied expeditiously by means of a large syringe.

(22) E. R. K. says: In a recent issue, you give a formula for calculating the solidity of the frustum of a pyramid. Will the same formula apply to the calculation of earth excavation: in other words, given the two end areas and the perpendicular distance between, will the formula for the frustum of a pyramid give a correct result? If not, what method must be employed? A. It will only answer for special cases. Generally some other rules are employed. You will find them fully explained in any good treatise on the