issued illustrated price list of the Wiley & Russell Manufacturing Co., Greenfield, Mass.

P. Prybil, of New York city, has several specialty catalogues—one of woodworking machinery, one of machinery for working brass, horn, ivory, etc., and one of shafting, giving illustrations and prices for appliances calculated to d a large variety of work.

Received.

REPORT OF THE SUPERINTENDENT OF PUBLIC INSTRUCTION. New York, 1886. Albany: Weed, Parsons & Co., State Printers.

LEVELING BY VERTICAL ANGLES, AND THE METHOD OF MEASURING DISTANCES BY TELESCOPES AND ROD. By August Faul. New York: John Wiley & Sons.

RETAINING WALLS FOR EARTH. By Malverd A. Howe. New York: John Wiley & Sons.

POCKET FIRE INSURANCE CHART FOR 1886. The *Insurance World*, Pittsburg, Pa.

OSBORN'S TABLES OF MOMENTS OF INERTIA AND SQUARES OF RADII OF GYRATION. By Frank C. Osborn. Cleveland, O.: *Engineering Era* Publication Company.

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Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

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If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, $40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

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Hercules Lacing and Superior Leather Belting made by Page Belting Co., Concord, N. H. See adv. page 30.

Combination Pliers, Gas Pliers, Wire Cutters, Wrench and Screwdriver combined. Billings & Spencer Co., Hartford, Conn.

Cushman's Chucks can be found in stock in all large cities. Send for catalogue. Cushman Chuck Co., Hartford, Conn.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Friction Clutch Pulleys. D. Frisbie & Co., N.Y. city.

Veneer Machines, with latest improvements. Farrel Fdry. & Mach. Co., Ansonia, Conn. Send for circular.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N.Y. See illus. adv., p.28.

Iron and Steel Wire, Wire Rope, Wire Rope Tramways. Trenton Iron Company, Trenton, N. J.

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nor if your lungs are badly wasted away can you be cured by the use of Dr. Pierce's "Golden Medical Discovery." It is, however, unequaled as a tonic, alterative, and nutritive, and readily cures the most obstinate cases of bronchitis, coughs, colds, and incipient consumption, far suspassing in efficacy cod liver oil. Send ten cents in stamps for Dr. Pierce's pamphlet on Consumption and kindred affections. Address World's Dispensary Medical Association, Buffalo, N. Y.

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.

(1) H. A. L. asks: Does the strength of an electro-magnet depend partly upon the amount of wire upon it, as well as upon the battery? A. Yes.

(2) E. A. M. asks: What is used to color lace ecru? A. Dip it in a solution of coffee.

(3) J. B. W.—Hard wood lumber should not be kiln-dried until marketed and ready for use. It is less liable to crack or become shaky after being cut to required size for use. Wagon and car builders have their own kilns, heated by steam, which is essential for perfect kiln drying. Such a plant may cost from one to two thousand dollars. We recommend you to correspond with lumber dealers in regard te establishing a trade.

(4) T. A. R.—Two to 3 inches in depth is considered a very heavy fall of water in a single storm. Instances have been known of much greater rainfalls. Have experienced a fall of 10 inches in one week in Illinois. A barrel might give a rough estimate of the depth of a heavy rainfall.

(5) S. S. desires a recipe for Worcestershire sauce. A. Mix together 1½ gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, ½ gallon Madeira wine, ½ gallon Canton soy, 2½ pounds moist sugar, 19 ounces salt, 3 ounces powdered capsicum, 1½ ounces each of pimento and coriander, 1½ ounces chutney, ¾ ounce each of cloves, mace, and cinnamon, and 6½ drachms asafœtida dissolved in 1 pint brandy 20 above proof. Boil 2 pounds hog's liver for 12 hours in 1 gallon of water, adding water as required to keep the quantity; then mix the boiled liver thoroughly with the water; strain it through a coarse sieve. Add this to the sauce.

(6) L. V. A. asks: What amount of air per minute will be displaced by a parachute falling with 100 pound weight attached? The amount of air displaced in one minute depends somewhat upon the size and weight of the parachute. If the whole weighed 100 pounds, it would descend with the velocity of the wind moving under that pressure for a given area. It is known that air moving at a velocity of 3,960 feet per minute exerts a pressure of 10 pounds per square foot. Then if your parachute weighing 100 pounds had 10 square feet area, it would fall when near the earth at the rate of 3,960 feet per minute, and would displace 39,600 cubic feet of air per minute. Increasing the area of the parachute 10 times, or equal to 100 square feet, would proportionally reduce the speed and displacement. This is for the density of air near the earth; higher up, the speed and displacement would be greater. This unequal density has been the cause of disasters in parachute descents. The velocity gained in the upper rare atmosphere, when met by the lower and denser atmosphere, has made the resistance so great as to collapse the parachute with fatal effect.

(7) W. W. S. asks: Will you inform me, through your valuable paper, of some preparation that will be cooling, to take the place of ice, that will rise as filling between two concentric boxes? A. One pound nitrate of ammonia to two or three pounds water is the best of the simple mixtures for producing cold, where no ice or snow is to be used.

(8) C. V. H. asks: Can you inform me through your Notes and Queries column the probable number of arc electric lamps in use in the United States? A. A little over a year ago the number was estimated, in an address by W. H. Preece, F.C.S., at 90,000. Since that period, assuming that estimate to be correct, they have probably passed 100,000. The American Electrical Directory for 1885 gives for isolated plants alone upward of 10,000 arc lamps.

(9) J. J. K. asks: Is there any way of removing the wrinkles from a person's forehead who has just passed his 21st birthday? A. The wrinkles are doubtless a natural formation, and cannot be removed. 2. What is the Irish population of the world? A. The Irish population of the world, native born, is probably under eight millions; many people make the figures very much larger, but it is by counting as Irish the children of Irish parents born in other countries than Ireland.

(10) C. C. C. asks: 1. How can I make a cell battery strong enough to kill a cat, not to be too expensive? A. You need an induction coil like the one shown in SUPPLEMENT, No. 160, but more powerful, or a battery of Leyden jars charged by an electric machine. 2. What is bird lime, how is it made, and about what is it worth? A. *a.* By boiling the inner green bark of the holly (Ilex aquifolium), and allowing it to stand 14 days to ferment. *b.* By boiling and then igniting linseed oil, or by boiling down varnish until thick and ropy. Care must be taken not to cause a conflagration. 3. What is animal magnetism, and when was it first noticed? A. No one knows. It is probably a mistaken term. It came into vogue in 1775. 4. What and where is the largest cannon in the world, and how far will it shoot? A. De Bange's new gun, described in SCIENTIFIC AMERICAN, vol. liii., No. 1, has, it is said, a range of 11 miles. For comparative sizes of large guns, see SCIENTIFIC AMERICAN SUPPLEMENT, No. 510.

(11) J. H. McN. asks: Is there any known fluid capable of carbonizing paper, or converting it into a conductor of electricity, that is not dangerous to handle? A. In general terms, there is not. Dilute sulphuric acid applied to paper and the latter exposed to heat will carbonize the paper to a certain extent.

(12) L. R. L. asks: 1. What is the velocity of light per second as computed by the best authorities? A. Recent determinations give light a velocity of 185,420 miles per second (Cornu), or 186,380 miles per second (Michelson). 2. What is the velocity of electricity per second, as computed by the best authorities? A. The velocity of electricity for transmission by wire varies from 18,400 miles per second for dynamic electricity to 288,000 per second for static electricity. For submarine cable it depends on the construction, capacity, etc., of the cable, when a direct battery connection is used.

(13) A. W. B. asks whether the free use of common salt at meals in injurious to the teeth. A. No.

(14) Tilsonburg asks: How many methods are there of connecting the wires on the armature, the field magnets, and the line, and what is the object and effect of each? Where can the insulated wire be procured? Will strips of copper ribbon suit for armature and field magnets? A. In general, three methods: *a.* By carrying the same wire around the armature and then around the field. *b.* By dividing the wire as it leaves the a mature, and carrying part around the field and using the rest for the line. *c.* Combinations of methods are sometimes used, called compound windings, which are of many kinds. In first method, resistance in the field reduces the strength of the field, and thereby reduces the current strength. In second method, the reverse is the case. Insulated wire is sold by all electrical supply dealers. Wire is generally used in preference to strips.

(15) O. L.—The term "trap" is used somewhat loosely in geology to designate several varieties of basic, igneous rocks. It includes dolerite, basalt, and greenstone, rocks which are similar in appearance, and which differ little in composition. In structure they are fine grained, and crystalline to granular on fracture. The color varies from a dark gray through different shades of green to black. The first, dolerite, is a mixture of labradorite (feldspar) with angite (a variety of pyroxene), and usually contains some titaniferous iron ore. Basalt is similar, but usually contains its iron ore in the form of magnetite. Small green crystals of olivene (silicate of iron and magnesia) are also found scattered throughout the mass. The greenstones are composed of feldspar and hornblende, with generally some admixture of chlorite (a silicate of magnesia). Trap occurs as a dike breaking through the other formations, and not infrequently connected with a level overflow. It is found in a number of localities in the Rocky Mountains and the far West. Also in the East, in Pennsylvania, New Jersey, and other localities, but has never been found near Louisville.

(16) R. Z. asks: 1. Has the United States Postal Department ever offered any inducements for a stamp or method of canceling stamps on letters more efficient than the methods now in use? A. We think not. 2. Are envelopes folded and gummed at the same operation of machine in making? A. Yes

(17) H. L. E. writes: I have a large English clock which was imported about 50 years ago. Whenever the weights get down to the pendulum, they begin to move, but not keeping regular time with the pendulum. Can you explain this? A. The weight vibrates in a sympathetic manner, but in its own time, from the action of the pendulum upon the air in the case, so that, when the weight reaches the level of the pendulum bob, the air partakes of a vortex motion, which sets the weight also in motion. If the weight was hung at exactly the same height as the pendulum, they would swing together. The phenomenon has long been observed, and is often illustrated by the synchronous vibration of musical instruments.

(18) D. F. writes: 1. A boiler is tested by cold water pressure up to 120 pounds. To what steam pressure is that equivalent? A. 75 pounds pressure allowed. 2. To what height can water be forced by a hydraulic ram, the fall from the supply to the pump being 6 feet? A. From 60 to 100 feet, delivery decreasing with increase of height. You may utilize 40 per cent of the whole flow at 60 feet.

(19) R. E. M. writes: What size overshot wheel do I need, having 4 feet fall of water, to make two horse power, said power to be transmitted 150 feet? A. You will require an overshot wheel of 4 feet in diameter, 6 feet wide, with buckets to carry the water from the spill or weir 6 inches deep by 6 feet wide, allowing for waste, and 6 inch wallow in tailrace. For friction and transmission by shafting, add 1 foot to width of wheel and weir, making it 7 feet wide.

(20) R. H. K. desires a recipe for a shaving soap which will soften the beard in cold water, and will remain for a good while on the face. A. We would advise you to try the following shaving cream. Take of:

Curd soap	8	ounces.
Almond oil	2	"
Glycerine	1	"
Spermaceti	½	"
Carbonate of potassium	¼	"
Water	16	"

Cut the curd soap into shreds, and dissolve it by the aid of a water bath in 14 ounces of water. Dissolve the spermaceti in the almond oil, and while warm mix it with glycerine, potash, and remainder of the water; transfer to a warm mortar, gradually and steadily incorporate the warm soap solution, and continue to stir until a smooth paste is formed. With this incorporate a suitable perfume.

(21) M. H.—Vacuum has but one technical meaning, void space with neither gas, air, nor s lids within its boundaries. It can be produced artificially as to air to less than a millionth of its volume.

(22) J. H. S. asks the diameter of a screw for a propeller to steam 20 miles an hour, and the rule for finding the diameter of any screw to propel a vessel at any rate. A. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 278, 181, 101, 208.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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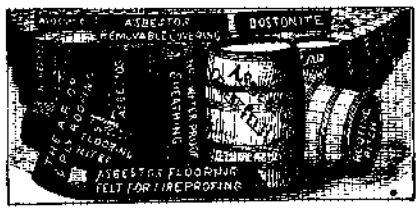

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