

Useful Information.

Hot air, drawn over steam pipes that are heated by exhaust or live steam and then blown through pipes to various points where it escapes, is a satisfactory method of heating shops.

It is argued that pulp can be used as a substitute for lumber in articles now made exclusively of wood. By mixing the pulp with clay, stearite, asbestos, plumbago and mica, substances of every possible color and compactness may be produced.

The *Chronique Industrielle* gives the following recipe for a paste that will remove the rust and not scratch the finest polished surface: Cyanide of potassium, 15 grams; soap, 15 grams; chalk (blanc de Meudon), 30 grams; water, sufficient to make a thick paste.

According to the *Moniteur Industriel*, a mixture of oil and graphite will effectually prevent screws becoming fixed, and, moreover, protect them for years against rust. The mixture facilitates tightening up, is an excellent lubricant and reduces the friction of the screw in its socket.

FOLLOWING is a comparative statement of the toughness of various woods: Ash, 100; beech, 85; cedar of Lebanon, 84; larch, 83; sycamore and common walnut, each, 68. Occidental plane, 66; oak, hornbeam and Spanish mahogany, each, 62; teak and acacia, each, 58; elm and young chestnut, 52.

The soundness of lumber may be ascertained by placing the ear close to one end of the log, while another person delivers a succession of smart blows with a hammer or mallet upon the opposite end, when a continuous of the vibration will indicate to an experienced ear even the degree of soundness. If only a dull thud meets the ear, the listener may be certain that unsoundness exists.

REMOVING FURNITURE BRUISES.—Wet the part with warm water; double a piece of brown paper five or six times, soak it and lay it on the place; apply on that a hot flat-iron till the moisture is evaporated. If the bruise be not gone, repeat the process. After two or three applications, the dent or bruise will be raised level with the surface. Keep it continually wet, and in a few minutes the bruise will disappear.

When a band saw has been dressed for the silver solder, take a clean piece of borax, wet it and rub on the parts of the saw to be joined. Then pulverize a little of the borax and sprinkle on the solder, first wetting the same; place this between the ends of the saw and sprinkle a little borax on top of the saw. Now heat the tongs to cherry red and clamp them on the saw for one minute; then pour on a little water and take the tongs off.

DYNAMITE FOR PILE-DRIVING.—An Engineer of Peeth, Mr. Pradanovic, has lately used dynamite for driving piles. A circular cast iron plate 15 inches in diameter and 3½ inches thick is fixed on the pile to be driven in a perfectly horizontal position. A dynamite cartridge made in the form of a disk 6 inches in diameter and ½ of an inch thick and containing 17½ ounces of dynamite is placed upon the cast iron plate and exploded by electricity. It is stated that the depth to which the pile is driven by each explosion is equal to five blows of an ordinary pile engine weighing 14½ Vienna cwt. falling 9 feet 10 inches. A cast iron plate on an average resists 25 explosions.

An eminent German physician recommends for the extinguishment of fires in closed places where the use of water or other liquids would be likely to do great damage, a dry compound, which, by its burning, absorbs the oxygen and quickly renders combustion impossible. The compound is composed of powdered nitrate of potash (saltpetre), 59 parts; powdered sulphur 36 parts; powdered charcoal, 4 parts; colcotha, (brown-red oxide of iron), 1 part. This preparation is one that can be cheaply made. It is recommended that it shall be, when thoroughly dried and mixed, put up in tight pasteboard boxes, holding about five pounds each, with a quick fuse in the side of the box—protruding six inches, with four inches inside—to facilitate and insure lighting it.

THE TRANSMISSION OF POWER.

Power in various forms, and multiplying as the years increase, has always existed, and been used by mankind. History, however, brings us very few facts along the line of mechanics, and it is therefore difficult to say when, how or where, any special form of power or method of transmission originated—at least, this statement is entirely true, if the last two centuries be not taken into account.

In his excellent work on "Hydraulics and Mechanics" Sir Thomas Ewbank remarks, "Tradition has scarcely preserved a single anecdote or circumstance relating to those meritorious men with whom any of the useful arts originated: thus nearly all knowledge of those to whom the world is under the highest obligations, has perished forever."

Probably the earliest power used—outside and apart from human and animal physical strength—was the power of the wind, followed, probably, very closely by the use of water power; and these four powers: human strength, animal strength, wind-force and water-weight, were humanity's powers for over fifty-seven centuries of this world's history. In the application of these powers, for practical, useful, or necessary purposes, transmission of power began, and from the very crudest beginnings, by slow processes of development, along the line of necessity, came the lever, the inclined plane, the wedge, the screw, the wheel and axle and the pulley, all in their place, and by a proper application and utilization of their advantages, becoming means for the transmission of power.

Let me be clearly understood here. I mean just what I say. The lever, &c., have been called from "Times dim morning" mechanical powers; but having no inherent strength or power, are they not (and can they ever be anything else, either separate or in combination) means for the transmission of force, or power in motion?

Ganot defines "power" to be that force which acts to produce motion. Power in motion, therefore, implies the use of means, or matter, and as a consequence, results, and I think we are safe in assuming every construction or machine, and every use of the lever, pulley, wheel and axle, wedge, &c., to be a means for the transmission of power; and whether the machine be of such a construction, (the Webb printing press for instance), as to contain within itself a combination, to a great extent, of all the mechanical forces, or a simple paddle in the hands of a canoeist, the fact remains the same, that the material made use of is a means for the transmission of power. And however varied the results may be, caused by the combination of these forces in the mechanical construction made use of it, the fact remains that in all these forms, the true purpose and aim of the users in the varied combinations is the transmission of power. With the introduction of steam, about the year 1768, a new power was added, and as a result the means and constructions for the transmission of power have been broadened and widened, still along the line of the mechanical forces, however, until the methods and combinations for the transmission of power have been multiplied to such an extent that volumes might be written, if one desired to go into details along the lines used.

In the transmission of power, from the motor—or power producer—in connection with the manufacturing industries of the world, during the seventeenth, eighteenth, and the greater portion of the nineteenth centuries, gearing was used almost exclusively; and many of our present engineers can remember the time when it would be considered heretical (in a mechanical sense) to even suggest the propriety of driving a line of shafting, or the machinery connected herewith, by any other means than gearing. Younger generations, however, not bound by the prejudice that entrained their fathers, nor hindered by the wisdom (?) of school-made "mechanical engineers," pushed by keener competition into developing the most available out of all their resources, have not hesitated to experiment along new lines, to compare the new with the old, and to adopt the better. As a result of this investigation and comparison by practical men, instead of noisy gearing for the transmission of power, belting and pulleys are

now used almost exclusively, and latterly, in a few instances, sheave pulleys and an endless rope.

Gradually, within the last few years, another power—electricity—is coming on to the scene. As yet being used, partially, as a means of transmitting power, and more particularly as a light producer, and not being self-productive, nevertheless, the indications are, that before many decades shall have passed, by the perfecting of the means of producing, controlling and conveying electricity, radical changes will be made in many of the important methods of transmitting power.—L. A. Morrison, in *Dominion M. & M. News*.

UPPER OTTAWA IMPROVEMENT COMPANY'S OPERATIONS.

The Upper Ottawa Improvement Company was incorporated in the year 1868, for the purpose of acquiring and constructing improvements on the Ottawa River to facilitate the transmission of timber and logs from the Des Joachims Rapids to Ottawa. The company proceeded to purchase and construct booms at Fort William, Des Joachims, Allumette, Melons, Chénail, Lapasse and Onio, and also between the head of Dechenes Rapids and Ottawa and at the outlet of the Hull slide. The paid up capital stock of the company is \$108,000, and the present directors are Messrs. Hiram Robinson, E. B. Eddy, E. H. Bronson, C. B. Powell and James Gordon. Mr. Robinson is President of the company, Mr. J. R. Booth, Treasurer, and Alderman G. B. Greene, Secretary. The works built and acquired by the company have been enlarged and improved from time to time as the necessities of the lumber trade required. For the use of their booms between 1868 and 1876 the company charged tolls upon logs and timber. In the last mentioned year additional powers were obtained, by special Act of Parliament, to enable the company to handle and sort for the owners all logs passing down the Ottawa from Des Joachims, and for this service a special rate is charged to cover expenses. The Chénail boom in Chate Lake was built by the Dominion Government, but is operated and kept in repair by the company—with the exception of the boat and raft trip—the Government allowing the company a percentage of the tolls collected at this boom. The lumbering community find the company's work of great utility and benefit, the cost of bringing logs and timber down the Ottawa having been reduced about fifty percent, since 1876, when the company undertook the handling of loose logs on the river. Rafts and cribs of square timber do not pass through the company's booms. Between the different works, on the navigable stretches, the booms of logs are towed by steamers, the use of a boom being to collect and retain logs which come over rapids singly, the practice being to tow the logs in booms to the head of a rapid and allow them to drift over—to be collected below and towed to the next rapid. All the towing from Des Joachims to the head of the Chate Falls is done by the steamers of the Upper Ottawa Towing Company, seven steamers and tugs being employed in this service. From Onio to Ottawa the towing for the north side is done by the steamer Chaudiere, owned by Captain Goulet, and on the south side by the steamer Monitor, the property of the Upper Ottawa Steamboat Company. During the season of 1885, the number of pieces passing the Onio boom was 2,362,361, and it is estimated that 2,750,000 logs, yielding 392,857,000 feet of sawn lumber will be handled by the company during the present season. During the summer season the company employ between three hundred and four hundred men.—*Ottawa Free Press*.

A RAILWAY TIE NURSERY.

Hon. R. W. Phippe, Forestry Commissioner for Ontario, has been for several months devoting his time to visiting the principal fruit trees, nurseries, and estates, where attention is given to arboriculture for timber and fuel. In a recent letter from southern Kansas to the *Toronto Globe* he writes:

"One railway board here, knowing that the growing of trees when set about in earnest is neither a slow nor difficult task, have established in Kansas the largest artificial plantation of

forest trees in North America. These railway gentlemen themselves gave out the contract for planting over a square mile of land with young saplings of the catalpa and allantua, and their president, observing the success of their experiment, and impressed with the probable excellent financial results, has had planted at his own expense as a speculation as much more. These are situated near the little town of Farlington, Kan. These plantations, now bare of leaves, stretch far over the undulating prairie in full view of the town. The different sections have been planted, it appears, respectively two, four, and six years ago. About one-fourth is planted with the allantua, the rest with the catalpa, and a few—perhaps 1000 trees—of white ash. Those first planted are now about 25 feet in height, the last about 12. Some of the taller are seven inches through the stem. The first seedlings were brought from Illinois by the railroad, the rest grown in seed beds here. There are in all about 3,000,000 of trees in full growing vigor on these plantations, this calculation leaving out a few on some small portions of poor land which are not flourishing so well, but will be good trees in time. All were planted four feet apart each way to shade the ground, but eight feet is the ultimate intention, which will allow three-fourths of the trees to be cut out, a thing which can well be done when they are fit for fence posts, say seven to nine inches through, or if required, they can stay even longer without injuring the plantation. Will rather larger it is expected the trees will make excellent railway ties, and at their fuller growth of 15 or 20 years they will supply very valuable timber for cabinet work and house building. Those who have only seen the original forest, with its trees growing at haphazard here and there, little ones and big, have but a very vague idea of the large amount of wood the closely planted grove can spare in their process of growth. This process, partly natural, is also by the art of the planter rendered partly mechanical. Extensive masses of young trees planted in this manner are restricted to but one method of advancement—the endeavor to throw out masses of leaves to the light and air of the upper surface. The lower branches, hidden in shade, rapidly die and fall to the ground, and the plantation becomes a multitude of long, straight stems, full of life and vigor, but only spreading into branch and foliage at the summit. If a tree in youth be crooked it straightens itself, if thus surrounded, as it advances in height. One acre so growing will give of wood, which is all the better taken, quite a number of cords yearly till all the superfluous trees are gone. On each acre here there are 2000 more trees planted than will ultimately be allowed to attain full growth. There will be left perhaps 900,000 to come to maturity, and as these, as well as being very useful timber, are fast-growing trees, the profits seem likely to be very large."

NEW BRUNSWICK LUMBER TRADE.

A considerable quantity of lumber is being held at Miramichi ports for higher prices. According to a correspondent at Newcastle, N. B. it is believed that the amount shipped to Europe this season will not exceed seventy million feet, as compared with 117,149,108 and 87 millions in 1882, 3, 4 and 5 respectively. Following are the quantities rafted at the South West boom in these years:—'82, 77,740,241 ft.; '83, 71,194,651 ft.; '84, 37,049,643 ft.; '85, 37,282,825 ft.; '86, 30,806,383 ft. Charters have ranged from 40 to 45 shillings per standard this year. Snowball's deals have been shipped up to date in 34 sailing vessels. No steamers have been employed this season. Most of the deals forwarded have been to ports in France and on the Mediterranean. Nearly all the deals cut by Richards & Hickson at Newcastle are piled up on their wharf, and Burchill, of Nelson, has only shipped two cargoes this summer. Scarcely any move has been made by operators as to next winter's work and those spoken to seemed to be greatly discouraged over the continued depression in the European markets and the prospect of no decrease in the government stumpage tax.

LEISHMAN & PERRY, saw mill operators, Bracebridge, Ont., are succeeded by Leishman & Co.