

DRIVING BY FRICTION.

For many purposes for which gear wheels were formerly used surface friction wheels are now employed. If the surfaces are properly matched as to material, and are sufficiently large as to area, there appears to be no reason why friction wheels cannot be more extensively employed than they have been heretofore. One of the objections has been that there must be an end thrust, which by its friction absorbs much of the power. It is a baseless objection, as may be seen in the friction clutch of the overhead countershaft of the lathe, and in many other situations where the release of the friction is the easiest and most natural movement. To be sure, in this case the amount of contact is very large—the entire circumference of the pulley—but the principle is the same; for where the pulley friction clutch must be held as one with the moving pulley, so the friction wheels are one so long as they are in contact, and their contact is a main point against the circumferential contact of the pulley clutch.

An objectionable method of employing the friction driving is to use a metallic surface against a wooden or a leather surface; two surfaces of wood are better; but if iron and leather or iron and wood are used together, the driver should, in all cases, be made of softer material. For when the driver is thrown in contact with the driven, it must make a number of revolutions before its contact will be sufficient to start the driven wheel. It is evident, therefore, that if the driver is of iron while the driven is of some softer substance, it (the driver) will wear a groove that will injure the surface of the driven wheel. It is much better, where it is practicable to make both the driving surfaces of wood.

Excellent wheels are made of maple—hard rock maple—and of lignum vitae, the lignum vitae wheel to be the driven and the maple the driver. The wheels should be a cast iron spider made to receive the wood, which should be sawed into wedge-shaped or radial segments, so that the end grain of the wood bears and makes the contact surfaces. Excellent results have been obtained, also, with hard rubber (vulcanized) and wood, where there was no oil to rot the rubber, and for small wheels there is nothing better than raw hide as prepared for pickers for looms and for small gears. This will stand oil and resist its disintegrating influence.

One of the advantages of friction wheels over cogged wheels is that when they are started there is no shock, but only a gradual coming up to speed. Another is their noiselessness; but the epicycloidal cutting of gear teeth latterly has made the objection untenable, as gears can be run as silently as belts. But a great advantage is the very slight movement necessary to connect and disconnect, the actual surfaces requiring to be merely and barely separated to insure a stoppage of motion.

ABOUT LUMBER.

The *Monetary Times* says:—The extravagant scale on which lumbermen are wont to operate on this continent, the expensive methods of conducting the business, and the disproportion which the cut often bears to the probable demand, have long attracted the attention of observers, and are now getting some consideration from lumbermen themselves. Says the *Chicago Northwestern Lumberman*, "A small cut of logs next winter is now more seriously talked of than it has ever been before. The necessity for reducing the cut was never more apparent than now. For the past two logging seasons less work in the woods would have proved highly advantageous, but the operators could not bring themselves down to a slow gait. Last season the marked conditions made an urgent appeal to the mill men to curtail their cut, but they did not heed it. Logging was so easily done that in many cases the tally sheets footed up big figures at an early date. Under such favorable conditions as existed work could not stop, or rather the operators did not think it could, and the result of the season's work showed a large crop. Many of the men who logged would be highly pleased if the greater portion of the logs cut were back on the stump. Many logs are selling at a price that leaves nothing for stumpage."

The simple and sensible conclusion of the

Lumberman is that this kind of business does not pay. Considering the amount of standing pine, and not only a growing demand, but one that will never cease so long as there is a pine tree in the Northwest, adds that journal, stumpage has a positive value, and it is extremely unbusiness like to slaughter it.

Respecting the lumber trade in the western part of Nova Scotia, the Yarmouth, N. S., *Herald* states "that the lumber trade of 1884 will show probably as large an output as that of any year in the history of Bridgewater. Messrs. Davidsons' output will be nearly or quite 14,000,000 feet, and that of Duffus & Co. in the vicinity of 5,000,000, while other mills will swell the total lumber product of the La Have to perhaps 25,000,000 feet."

The *Ottawa Citizen* of 30th July makes the statement that the number of rafts passing through the slides at Ottawa this year is the smallest known for several years. This is owing to the large shipments of square timber by rail.

A Montreal despatch of Tuesday last to the *Quebec Chronicle* runs: "The shipment of lumber to date for American ports is upwards of two millions of feet in excess of that of last year."

NOTES ON SOME MALAY TIMBER TREES.

The following is an extract from an article by Mr. James Collins in a recent number of the *Journal of the Society of Arts*, which also contains a table showing the results of experiments on the stiffness, and giving the characteristics, of some of the principal woods of Singapore, Malacca, and Johore. The subject of a large supply of timber is a most important one, and a few notes on the question as regards to the Straits Settlements will, it is hoped, be found of use. These will be but brief and preliminary, as the materials at command are too scanty at present to deal with the question otherwise. Johore, although an independent state, under the rule of His Highness the Maharajah of Johore, K. C. S. I., &c., is also included in the present note.

The extent of forests has been variously stated, but the following figures may be taken as an approximation:—

Singapore.....	20 to 30 square miles,
Malacca	160 to 170 "
Penang and Province Wellesley	110 to 120 "
Johore and adjacent Islands.....	10,000 "

To this must be added Selangor, Perak, and the other native states of the Malayan Peninsula, some of which are more or less under British Government control.

The forests of the Straits Settlements, properly so called, are the sole property of the Government, as is the case also with those under the Maharajah's rule. They are, however, in all cases rapidly decreasing, and no means are taken to stop this. The system of working them is as follows:—A person wanting a tract of land applies to the land office, and pays tenths on the value of the timber cut. Forest rangers, and occasionally the police, have to see that none but those having this license or permit cut timber.

This land may be required for the timber on it, or for clearing for the cultivation of various products, and the forest supply of timber suffers most materially if the occupation of the land is not permanent but temporary. Thus a tract of land having been secured, the primeval forest is cut or burned down, and the timber left to rot. Between the fallen trunks, gambier, pepper, rice, tapioca, or other products are raised, and after a few crops have been taken off, the ground becomes exhausted. To procure and clear a fresh spot is often cheaper than manuring the old soil, so the previous plantation is abandoned to white ants, secondary jungle—as a rule ofalang grass—low scrub, with here and there small and useless trees. Thealang grass (*Andropogon carinatus*), when once it gets possession of the ground, stifles everything else, and its long fibrous and tough roots resist all native efforts to eradicate it; even a prairie plough would possibly reclaim the land at too great a cost. The pretty little sensitive plant *Mimosa*

soon carpets the ground with its flaming yellow flowers, and it is more difficult to eradicate.

Singapore hardly cuts any timber at all for her own use, being chiefly supplied from Rhio and the adjacent islands, and also from Johore. In Malacca a greater quantity can be cut, but from want of roads or streams it is very difficult to get timber from a greater distance than fifteen to twenty miles from the town. Penang and Province Wellesley cannot cut much timber, unless the risk of climatic disturbance be run. The Straits Settlements export no timber to speak of; what little Tampinis and other hardwoods which have been shipped occasionally to Ceylon and Mauritius being chiefly from other islands.

With the territory of Johore the case is different. Some years ago H. H. the Maharajah erected extensive steam saw mills, and these mills, under the enlightened and able management of Mr. James Meldrum, have placed in the markets a large quantity of timber.

The following figures have been supplied me by Mr. Meldrum. Exports of timber from Johore, 1863—1874:—

To British India.....	15,000	\$115,000
" China.....	7,000	84,000
" Mauritius.....	3,000	36,000
" Java.....	2,700	27,000

Taking in "sundry places," about 40,000 loads of hardwood have been exported, principally in the form of logs or railway sleepers; the trade in the latter has fallen off, through the more general employment of iron cradles. About 60,000 loads of softwoods, in the form of logs, planks, boards, &c., have been exported. Of these softwoods 25,000 loads were taken by Singapore, at a value of \$270,000.

Mr. Meldrum states, as the result of about twenty years' experience, that the Johore forests are diminishing rapidly, that the seashores, islands, and other easily attainable localities are cleared, and that a good supply cannot be hoped for till the rivers are made more navigable and good roads pushed into the interior.

As will be seen, no steps have been taken as to conservancy or cultivation, and this calls for immediate attention. As to how this is to be managed need not be entered on here, but in parenthesis we may state that in following in the lines of the Indian Forest Conservancy, with a few modifications, would amply meet the case.

As to the climatic changes brought about by the clearance of forests in this part of the world very little can be said. The late Dr. Randall, Principal Medical Officer, S. S., in his *Annual Meteorological Abstract* for 1873, has the following:—

"The only causes that appear to me to exist, or have existed, to which this great decrease of rainfall may be attributed, is the extensive clearing of forest on the mainland of Johore, contiguous to this island (Singapore), which has been effected principally during the period under notice; and I would suggest that the conservancy of portions of forests may be taken into the consideration of Government."

Certainly many old inhabitants have informed me that the heat is greater and the rainfall less in the Straits Settlements than it used to be. One thing, however, has done largely to mitigate and render less apparent the great destruction of forests, and that is the enormous extent to which the coconut palm and other fruit trees are cultivated.

AMERICAN WOODENWARE.

Perhaps in no branch of American industry has greater progress been made during the last thirty years than in the vast and varied manufactures of wood. We have not only distanced all rivals in this branch of industry, but we have gained a firm foothold in foreign markets, especially for agricultural implements, furniture, and a variety of labor-saving machines. The perfection to which our wood-working machines have been brought by unrivalled ingenuity has given American manufactures of wood a world-wide reputation. For, as nine-tenths of the cost of articles included under the head of "woodenware" consists in the labor necessary to their manufacture, and the wages of labor in this country are comparatively high, it could

hardly have produced successfully its own woodenware without the aid of machinery. With this aid, however, the home market has not only been supplied by home dealers, but American woodenware has found its way into various foreign markets. For instance, the exports of woodenware for the year ending June 30, 1882, were valued at nearly half a million of dollars. The manufacture of furniture increased in value from \$17,633,000 in 1850 to \$75,539,000 in 1870, while the estimated increase in the last thirteen years has been very large. The growth in the manufacture of agricultural implements has been still greater. With woods of all kinds in abundance and easily accessible, with improved machinery for the purpose, there seems to be no reason why the exportation of woodenware should not yearly increase.—*Journal of Progress.*

HOW PIPES ARE MADE.

The short clay pipe formerly used by smokers has of late years been to a great extent supplanted by the wooden pipe the manufacture of which is now an important industry. Some interesting information respecting these pipes is given in Consul Inglis's trade report on Leghorn, whence the material for making wooden pipes is now largely exported. Similar works are also to be found at Siena and Grosseto. Selected roots of the heath—preference being given to the male variety—are collected on the hills of the Maremma, where the plant grows luxuriantly, and attains a great size. When brought to the factory the roots are cleared of earth, and any decayed parts are cut away. They are then shaped into blocks of various dimensions with a circular saw set in motion by a small steam engine. Great dexterity is necessary at this stage in cutting the wood to the best advantage, and it is only after a long apprenticeship that a workman is thoroughly efficient. The blocks are then placed in a vat, and subjected to a gentle simmering for a space of twelve hours. During this process they acquire the rich yellowish-brown hue for which the best pipes are noted, and are then in a condition to receive the final turning; but this is done elsewhere. The rough blocks are packed in sacks containing forty to one hundred dozen each, and sent abroad, principally to Franco (St. Cloud), where they are finished into the famous G. B. D., or "pipes de bruyere," known to smokers in England under the name of "briarwood" pipes. The production of this article is considerable, four hands turning out about sixty sacks per month. Consignments are also made to England and Germany; but, the Anti-tobacco Association will be glad to hear that at present the demand is said to be rather slack.—*Timber Trades Journal.*

WHITEWOOD.

Whitewood is very easy to work—it probably ranks next to pine in this respect—takes a good finish and makes a close joint. There are complaints against cypress for sash, doors, and blinds because, it is said, it is too hard a wood to drive together and make a perfect joint. Too much work must be put on the pieces where they come in contact to cause them to fit closely. In pine work this extra work is unnecessary. The wood is so soft that it readily gives, and the tight joint is at once produced. There are others who claim that such a fault with cypress does not exist; but that it does somewhat there can be no question. Not that perfect cypress sash, doors, and blinds are not made, but it requires a little more attention and labor to make them than it does from pine. In regard to softness, whitewood probably ranks next to pine; it is not quite as easily worked as pine, and a little more easily than cypress.

The Doomed Chestnut.

A scientific authority claims that the chestnut tree, which is disappearing so rapidly, has a fixed period of evolution. This tree, like all others of the spongy inferior fibre, cannot flourish beside the close-fibered trees, such as the oak. In ancient times a rank, quick growth covered the earth, which yielded, as the ages went, to the stouter trees. Thus it is the chestnut is doomed in the operation of the same law.