

POWER TRANSMISSION.

One of the most deplorable circumstances connected with practical mechanics, says the *St. Louis Miller*, is the wanton carelessness in the adjustment of shafting, gearing, belts and all means of transmitting power. As has been repeatedly stated in these columns but a mere fraction of the heat units represented in a ton of coal is utilized, by far the larger portion consumed in overcoming friction (some of which is more than useless), supplying the deficiency caused by petty leaks and the like. These of themselves appear to be and really are small matters of themselves, but taken in aggregate they amount to more, by a large majority, in the consumption of power than is represented by the force really utilized. The first practical idea to be impressed on an apprentice is the saving of patience, time, labor and profits by a neat adjustment of the minor parts of machinery, and more especially all knuckles, joints, oops, belts and the like. If we take a new belt so cut and joined that it runs evenly over both pulleys, we will find that, so far as these two wheels are concerned, all the friction to be overcome is by the adhesion on the arc of the surface contact. Now if we unlace the belt and cut off a tapering, wedge-shaped piece from one end and draw together, we will find that the belt is of unequal lengths on each side, and, of course, it bears harder on one side of the pulleys than the other, so that one side has all the work to do, and, in accordance with the law governing this motion, the belt is attempting to adapt itself to these applied unequal forces, a side motion is introduced, begetting another, and the hardest kind of friction to come, viz., a sliding motion across the pulleys when in motion. This motion not only occurs on one pulley, but on both, and every inch of the belt, however long and wide, partakes of this motion, the friction of which in some cases amounts to nearly if not quite as much as that needed to propel the machine. As a consequence the boilers are put to extra work, the engine labors fearfully in doing half its estimated work, and the entire machinery drags, the belt shows early evidences rapidly, and innocent parties are blamed, when, in reality, the fault lies with the carelessness of the one who sewed the belt.

Again, a system of belt tighteners and idlers are rapidly coming into use, that not only increase the work demanded of the machinery, but of themselves are fearful consumers of power by being improperly hung, so that they augment the evil intended to be overcome. A tightener or idler should be so adjusted that the point of contact, friction and motion is as perfect for the service required as the drum pulley; but very often it is thought that any appliance, however crude and ungainly, will do for a tightener, and that they are placed in position with no regard to the proper distance from the drum or pulley, and with still less reference to the difference in size of the two. There is a wrong as well as right way of doing this, but we see the former oftener than the latter.

PROTECTION OF FORESTS.

The Forestry Commission, of New York, at a recent meeting in Albany, adopted some rules and regulations for the protection of the forests from destruction from fire. They are as follows:—

FIRST.—All persons having occasion to burn a fallow or bush at a fire in any old chopping, wind slash, stump or berry lot, swamp, "viale," or beaver meadow, for the purpose of clearing or improving, shall give five days' notice of such intention to the nearest Fire Warden, Forester, or agent of the Forest Commission. He shall also give notice to any neighbors who may have fields or woodlands adjacent, and liable to injury, at least one day previous to the setting of such fires. Such fires will be permitted only when the wind is favorable, and competent persons must remain on guard until the fire is completely extinguished on the surface and in the "duff."

SECOND.—All hunters, fishermen, loggers, guides, tourists and others lighting fires, in or near the forest for cooking, warmth, insect smudges, or other purposes, must clear away all combustible material from within six feet of the place where the fire is to be kindled, and must

thoroughly stamp out, drench, or otherwise extinguish any such fire upon leaving it either temporarily or permanently; and hunters using firearms with inflammable wadding are hereby cautioned against allowing fires to start from such causes.

THIRD.—Smokers are cautioned in regard to fires arising from any carelessness of theirs, and their attention is called to the penalty for negligence in causing fires. Parents and teachers are respectfully requested to instruct children to avoid lighting fires in the forests or exposed places.

FOURTH.—Peeling standing trees of their bark for covering camps or shanties is hereby prohibited. For such purposes the tree must be felled, and all the available bark removed therefrom before another tree is cut down. The trees thus cut down must be utilized for firewood, and such fallen timber as lies in the vicinity of the camp must also be used for fire wood before any green standing timber is cut for that purpose.

THE COAL FIELDS OF NEW SOUTH WALES.

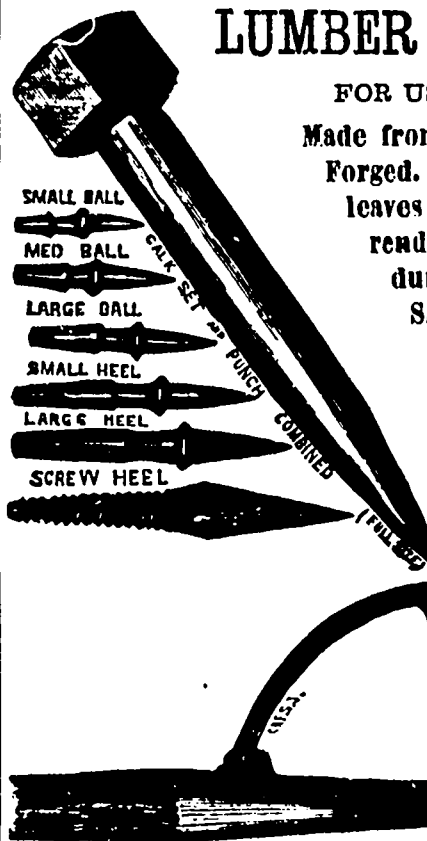
The coal-beds of New South Wales are of enormous extent. The mineral has been traced for hundreds of miles along the coast, and has been worked at various levels from 450 feet below to 1,600 feet above the sea. The lower beds are geographically older than any that have been yet worked in Europe, and the quality of the coal which is taken from these inferior strata is therefore unsurpassed. Not only so, but in certain districts immense seams of this mineral are found in immediate juxtaposition with an abundance of iron ores, limestone and fireclay. Hence nature seems to have indicated New South Wales as the great manufacturing colony of the Australian group. Up to the present time, coal has been ascertained to exist over an area of something like 25,000 square miles of country; and it is almost everywhere within easy reach of water and railway communication. Now, when it is remembered that the coal-fields of Britain only cover one-twentieth part of the area of the country, or about 4,000 miles, and that nevertheless the output of this mineral in the mother country is upwards of 120,000,000 tons per annum, it would be difficult to overestimate the magnitude of the proportions to which the coal trade of New South Wales may be expected to grow hereafter.

IMPERIAL FEDERATION.

A circular has been received at this office from the London, England, Chamber of Commerce, giving the conditions prescribed in connection with a prize of £50 offered for the best essay on Imperial Federation and how it can be practically carried into effect. The essay should treat only with practical suggestions, may be written by any British subject, should not exceed in length twenty-five pages of foolscap and have a margin of two inches on the left and be written on only one side of the paper, must be in the hands of the secretary of the chamber, at 84-85 King William street, London, E. C., by August 31st, 1886, and must have a motto or a distinctive character attached, and a sealed envelope must be sent having a similar motto on the exterior, but having the writer's name inside. "Imperial Federation Essay" should be marked in the left hand corner of each envelope. The judges are Sir Alex. Galt, G. O. M. G., Prof. J. R. Seeley, M. A., and Mr. James Anthony Froude, and their decision will be final. All essays will become the property of the Chamber and the writer of the best one will receive a prize of £50.

The South antagonizes the proposition to put lumber upon the free list because that section is now the possessor of the only great forests remaining in the Union. So long as the West had its forests, argue the Southerners, Canadian lumber was kept out, and it is only fair that the South should be similarly treated now. Canadians who look to the future do not covet an increased consumption of our lumber by our neighbors.—*Toronto World*.

Last year the Rathbun agency at Ottawa shipped 6,000,000 feet of lumber to Oswego.

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