

events abated business intensely; but it is gradually recovering. The natural resources of the country are great, and Spanish people, kept to their own boundaries, will soon display their vitality."

GERMANY.

A limited quantity of pine deals and hardwoods are now exported from Canada to Germany. The requirements of that market, with its extensive manufacturers, are very great, and with vigorous and well directed effort on the part of our exporters a much larger trade could undoubtedly be secured. Nearly all kinds of lumber have been allowed to enter that country free of duty, but a more protective tariff has just been put into force.

CANADA'S COMMERCIAL AGENTS.

FOLLOWING is the correct official list of Canada's Commercial Agents in Great Britain, British possessions and foreign countries:

J. S. Larke, Sydney, N.S.W., agent for Australasia.
G. Eustace Burke, Kingston, Jamaica, agent for Jamaica.

Robert Bryson, St. John, Antigua, agent for Antigua, Montserrat and Dominica.

S. L. Horsford, St. Kitts, agent for St. Kitts, Nevis and Virgin Islands.

Edgar Tripp, Port of Spain, Trinidad, agent for Trinidad and Tobago.

C. E. Sontum, Christiania, Norway, agent for Sweden and Denmark.

D. M. Rennie, Buenos Ayres, Argentine Republic, agent for Argentine Republic and Uruguay.

In addition to their other duties, the undermentioned will answer inquiries relative to trade matters, and their services are available in furthering the interests of Canadian traders:

J. G. Colmer, 17 Victoria street, London, S.W., England.

Thomas Moffat, 16 Church street, Cape Town, South Africa.

G. H. Mitchell, 15 Water street, Liverpool, England.

H. M. Murray, 40 St. Enoch Square, Glasgow, Scotland.

Harrison Watson, Curator, Imperial Institute, London, England.

FOREST PROTECTION IN MINNESOTA.

THE third annual report of the Chief Fire Warden of Minnesota has been published, from which it appears that, according to the reports of fire wardens, the damage done by forest fires in 1897 was \$22,455, and by prairie fires \$14,554. Considering that the value of the standing timber in Minnesota is \$100,000,000, the reported damage by forest fires is regarded as very small. The report states that the value of the pine, just as it stands, that is cut in Minnesota in a single winter, in a favorable business year, is \$5,000,000 when sawed into lumber at the mills, its value will have increased to \$10,000,000, of which increase 80 per cent., or \$4,000,000, represents labor; when further manufactured and worked up in various forms its value becomes multiplied. This partly illustrates the value of the forests as an industrial resource.

The Chief Fire Warden thinks that as the public comes to understand forestry it will be easier to enforce the law against forest fires. A leading principle of forestry, he says, is that the best agricultural land should not be devoted to forest. One of the great economic advantages of forestry is that wood and timber can be profitably grown on soil that is unfit for farming purposes. Another principle is that the forest must be continuous; that no more timber should be taken out of it in a year, or in a series of ten or twenty years, than it grows in the entire forest the same period. Another principle is that the cutting of timber should be in blocks or strips so as to facilitate reproduction on the clear areas by seeds falling from the trees left standing. Another principle is that the forest when young must have in numbers vastly more trees than when it is mature. The tree grown in the open may be handsome and useful for shade, but it is useless for timber. To make good timber the forest, when young, must be crowded so as to secure height growth. Mixed wood managed on forestry principles in the Black Forest of Germany has per acre, at the age of 20 years, 3,960 trees; at the age of 100 years, 262 trees.

The manufacturers of lumber in the Southern States propose holding a conference at an early date to discuss the methods to be adopted for securing the trade in lumber with Cuba and Porto Rico.

HINTS ON BUILDING BAND MILL TRACKS.

By A. J. BURTON, Algonquin Park.

A FEW suggestions as to the method of building band mill tracks may be appreciated by the practical readers of your journal. One important consideration is that the timber or track ways should be of good sound wood. Southern pine is very well adapted for the purpose, owing to its strength and the fact that it will not warp or twist easily. Plane the track timbers on all four sides as straight as possible, and endeavor to have the timbers of good length to avoid making the joint opposite the saw. Set the timbers 2 inches or 2½ inches into the cross timbers of mill, and bolt down the track timbers, say, every 6 feet. By bolting them it will be much easier to level up the track, for the high places can be drawn down and the lower places can be shimed up, always assuring a good level track. Key the trackways solid by driving hardwood wedges in the gains in the lower cross timbers which the trackways are let into; next, stretch a line parallel with lower band wheel shaft and put down the V or guide track first, which should always be the farthest from the saw, so that it will get less jar from heavy logs and from the nigger than if placed on the saw side, and moreover, you will have less trouble in keeping the track in line. The line should be two inches higher than the top of track iron.

After laying down both tracks temporarily, make a wood straight-edge long enough to reach from one track to the other, and cut a notch in it to fit the guide track exactly, and fair over the centre of guide rail drive in a nail to be used for a guide as a pointer to set the guide rail true to the line by. You can move this straight edge along every foot or so, and with care can set a guide track perfectly true.

It is taken for granted that the track is straight and level, that the edges of the band mill wheels are turned true, and that the lower wheel shaft is perfectly level. Draw a line parallel with the track from one end to the other; then draw a line across the track above the floor in front of band wheels and square this with the first line; then, from sticks or supports above the upper wheel, let fall two plumb lines at opposite edges of front side of upper wheel, and let these lines fall directly to or at equal distances from the line already stretched across the track. Then, by moving one or both ends of the lower wheel shaft, square the wheel shaft with the line across the track by having the opposite edges of the band wheel at exactly the same distances from the two plumb lines, and adjust top wheel in similar manner. It is better to have a band saw trained a little in rather than out of the log, but it is best to have it perfectly parallel with the track. Having the wheels properly lined, do not move the cross line again, not even to adjust the saw, but put saw on mill, run it slowly, and adjust saw with the tilt until the saw runs from ¾ to ⅝ of an inch off the front edges of wheels. If your saws are hammered alike you will not have to move the tilt again for the season's sawing, unless the saw gets hot or meets with an accident, for saws will all run alike if put up alike. Adjust guides carefully and slack off all four guides from saw. Next, set the lower log side guide up to saw, put in a sheet of writing paper between guide and saw, and then screw up the guide until paper will not fall out, but not so

hard as to move the saw out of line. Then fasten the guide firmly put in another piece of paper between the saw and the board side guide, and push the guide up and fasten firmly, and if right the paper will pull out tight and leave a perfectly guided saw without too much or too little clearance. Set the top guides same way, but always be careful not to move saw out of line when setting the guides.

If a band saw is hammered and fitted right, and the mill and guides are properly lined, the saw will stand a good feed and cut straight lumber.

SPACING AND LENGTH OF BAND SAW TEETH.

THE spacing of band saw teeth as used on bands and band resaws varies from 1 to 2 inches, but the great majority run a spacing of about 1½ to 1¾ inches. There is nothing to recommend a longer spacing than the above, unless it is desired to run a long tooth with extreme hook. In such case a 2-inch spacing may be used with a throat from ¾ to 1 inch deep on a log band saw and from ⅝ to 9/16 on a band resaw, with a large rounded gullet quite similar to that run on a circular saw. Shorter teeth are usually preferred for hardwoods and frozen timber than are used for softwoods or summer sawing. Thus a ½ inch tooth is generally used for hardwoods in winter and 9/16 in summer, while teeth for soft woods range from ½ inch to ¾ inch, or longer.

A style of throat that is very popular in many sections, and especially among the cypress manufacturers, is the rather long throat with the base line about horizontal. It is impossible to suggest that any particular style of tooth is best adapted to any particular wood, for the reason that all shapes of teeth are apparently used with success in different woods. Expert users of band resaws find that for boxboard work not over 12 inches wide, a spacing of 1½ is satisfactory. In work demanding a minimum saw kerf and a moderate speed for saw, as in sawing picture backing, etc., a 2 inch spacing is found good. The same is true of resawing panel stock and hardwoods. Kiln dried hardwood, such as oak, hard maple, etc., tends to dull the saw very rapidly unless the feed is well regulated, and it is well to have the saw stand a fair feed instead of simply allowing it to rub the dust away. Careful feeding of the saw in kiln dried hardwoods will enable the saw to do good work in cutting considerable stock, where feeding without exercise of careful judgment may dull the saw in a few minutes.—From Baldwin, Tuthill & Bolton's Manual.

GREAT FORESTS IN INDIA.

FEW people have any idea of the immense forest area in British India—a valuable asset which is now being systematically preserved. At the present time the reserves of the forest cover an area of nearly 75,000 square miles, and they may be hereafter further extended in Madras and Burma, where the work of reservation is as yet incomplete. Outside these reserves are about 56,000 square miles of state forests, some of which will eventually be brought within the reserve area. This means that there are in India practically for all time forests which would completely cover the United Kingdom. The mountain slopes of the Western Ghats are still covered with the vegetation of the primeval forests.