

the mill owners are going farther for their log supplies each year. He expects his contrivance here described to work a revolution in log driving, bringing a speedy and satisfactory solution of the difficulties that beset it, and robbing it of many of its picturesque and dangerous features.

To further facilitate the work of log driving on the Gatineau, Mr. Bingham has had a tug placed on the river this season. The boat, which only draws 31 inches of water, is built so that it can be hauled around the portages on a waggon specially built for the purpose. A great saving of time is effected in the drive, and the labors of the men lessened by the use of the tug. The unique craft is called the "Airn of Quebec."

Mr. Bingham has built the booms, piers, and other improvements on the Gatineau which facilitate his work of log driving. He has had an interesting and successful career. He was born on May 13th, 1840, at Bytown, now known as Ottawa. At the age of 13 he learned the milling business, following it for about three years, at the expiration of which



MR. SAMUEL BINGHAM, OTTAWA.

time he entered the employ of J. M. Currier and James Maclaren, for whom he worked four years. He was first employed as cook's assistant on a limit up the Gatineau, but in 1873 he turned his attention to log and timber driving, being rewarded for his application of intelligent, industrious principles by a bountiful share of success. The "River King," as he is known, is esteemed as a man whose bond and word are equally effective. His integrity and application have gained him the respect of all classes. In 1886 Mr. Bingham was nominated for parliamentary honors, but declined. Previous to this, in 1880, he was elected as representative of Ottawa ward in the City Council, holding the honor for eleven years. During this period Mr. Bingham occupied the position of Chairman of the Board of Works and Property Committee. Bingham Bridge, over the Rideau river, is called after him.

His fellow citizens had such a high opinion of Mr. Bingham's worth that they elected him Mayor of Ottawa in the years 1897 and 1898. As chief magistrate of the capital he exercised with wisdom and benefit to the city and citizens, the sterling business principles and ability that have gained him such a large measure of reward

in the lumber world. Mr. Bingham is considered one of Ottawa's leading public spirited citizens. He has fitted up a public gymnasium and in other ways has given evidence of the possession of a deep regard for the welfare of the youth of the capital. He has an ideal home on Sussex street, Ottawa. He has, with Mrs. Bingham, travelled extensively, and is an interesting conversationalist, having a thorough grasp of public happenings.

SAW-MILLING REVOLUTION.

Under the above heading the Australasian Ironmonger, of Sydney, Aus., describes a saw mill equipment imported from Canada which seems to be entirely different from anything in use in that country. The characteristic features of the different machines are referred to in the following manner:

"The most modern breaking-down saw in Australasia has already been mentioned. It has been imported from Canada by Mr. H. McKenzie, Australian Mills, Sydney, and shows the veriest new chum that saw milling will be completely revolutionized by its introduction. Very different to the old pit or frame saw, it is not easy to explain in type.

"First of all, the machinery is entirely above ground. The carrier resembles in shape that of a steam hammer. The saw is a complete band, 50 feet long, resting on and travelling over a pulley 9 feet in diameter. It is swedge toothed, and is driven at the rate of about 350 revolutions a minute, and as it is cutting all the time, this equals (allowing for irregularities in driving) 1500 feet of saw per minute, rather a contrast to the old vertical saw that cut its own length, and then had to be raised ere it cut again on the down action. That is all one sees at first sight. Now for details.

"Three men in three minutes raise the saw, place it on a frame above the carrying wheel, then slide it on, pass the guide arm into position, and the saw is ready for use. The engineer stands on a platform at the back of the saw, somewhat to the left. Grasping a lever he slowly starts the saw, and having seen that it is running smoothly, brings the speed up to the standard mentioned; then, with the hand on another lever, gradually draws the log up to the saw, and the squaring begins. The carrier is a wonderful piece of mechanism. It is controlled by steam, through a 10-inch cylinder, and is 42 feet over all. The engineer has such control that, having drawn the log up and made the cut, he immediately touches a lever, releasing two coil springs, which move the whole carrier and log about three-quarters of an inch away from the saw, so as to secure its safe return; another lever opens the valves of the cylinder controlling the carrier, and the 42-foot piston travels back three times as quickly as it came forward. Strong buffers are provided to prevent over-running. The piece cut falls on a plate between the engineer and carrier, and rollers, operated by steam, carry it away to the back of the mill.

"Part of the plant is a log-hauler. The mill is situated on the harbour's edge; the logs are floating below. The hauler has to bring each log from the water, and place it upon the carrier or feeder. This is done with an endless chain, studded with spikes, which, travelling under the logs, holds them by their own weight, and carries them to the correct level. Here revolving, parabolic-shaped drums, studded in the same manner as the chain, retain and control them on the level, and help to convey each in turn to the feeder carriage. Once there, the log is secured and adjusted very safely, though simply. There is no hand-spike business, or driving in of dogs, as of yore. The feeder is fitted with strong standards, called boss dogs, which contain finger grips which are out of sight till the log is in position, and then with the movement of a lever, suddenly leap out and seize the log. They are shaped like the fingers ready to grasp, or claws, nearly half-circles, and operate up and down, taking such a grip that it is impossible to move the log. Each standard may be operated separately, so as to conform to the shape of the log. When thus fixed, the engineer, with the aid of another lever, adjusts thickness of cut, which is gauged in notches.

"By the aid of this mill, Mr. McKenzie figures to cut 30,000 ft. of timber daily. So much for the saw. Now for adjuncts.

"At the ends, fore and aft of the carrier, buffers

similar to railway car buffers are fixed to restrain a cussion, should such occur. Behind the engine is fixed a gang edger, which, if needed, is brought into operation to dress the edges of any of the logs that may be at all irregular. It is a compact machine, and does its work in good style, cutting the same time any width required. Up another mill, the engineer, who was sent on several (of which several) have every other tooth missing, and explain that the object was to allow for the growth of the ones, as the old were worn out through sharpness &c.; that the 50 ft. of steel, 9 in. wide, weighs something like 3 cwt., is of gauge 14. He also shows a sharpener, a smart little machine, with a revolving emery wheel and gauging setter, all of which worked by steam. It is necessary to place the log standards, so as to have it on the back edge, and approach the sharpener. The standards are placed a circle to facilitate the handling.

"The makers of this really wonderful mill are Waterous & Co., of Brantford, Canada, and Mr. McKenzie £3000 to secure the plant, irrespective of expenses of erection and engagement of Mr. McKenzie engineer. A view of the mill is of deep interest."

EFFECT OF SCALE IN BOILERS.

THE commonly accepted idea is that the efficiency of a steam boiler is seriously affected by an accumulation of scale. Perhaps the most often quoted estimate is the presence of 1-16 in. of scale causes a loss of 1 per cent. of the fuel burned, $\frac{1}{8}$ in. 3 per cent., and $\frac{1}{4}$ in. 5 per cent. Recently, says the Street Railway Journal, we have seen published statements tending to show that the loss of efficiency due to scale has been greatly overestimated.

Prof. R. C. Carpenter, of Cornell University, was in the American Electrician, says that so far as is determined by tests a lime scale, even of great thickness, has no appreciable effect on the efficiency of a boiler. A test which he conducted when the boiler was thickly covered with lime scale showed practically good results as when it was perfectly clean. The explanation is that the heating capacity is affected principally by the rapidity with which the heated gases will surrender heat, as the water and metal have capacities for absorbing heat more than a hundred times faster than the scale will surrender heat. Any deposit which curtails the capacity of absorbing heat on the water side has very little effect either on total capacity or efficiency. A thin film of grease, however, being impermeable to steam, keeps the latter from the metal and generally produces disastrous results.

Mr. Walter M. McFarland, formerly an engineer officer in the United States Navy, in the course of a lecture at Sibley College, Cornell University, stated that his experience had been that a considerable thickness of clean uniform scale made apparently little difference in the efficiency of the boiler. On the U.S.S. Fish Hawk there were two boilers used for distilling water, and the water evaporated per pound of coal was no more when the boilers were clean than after three months when the scale was nearly $\frac{1}{4}$ in. thick.

On the other hand, there are recent tests showing that scale does reduce the efficiency. In May and June, 1900, Prof. L. P. Breckenridge, of the University of California, made tests on a locomotive boiler before and after cleaning it of scale and found that the loss due to scale was 9.55 per cent. The average thickness of the scale was 3-64 in.; analyses of samples taken at different points in the boiler showed from 20 to 60 per cent. calcium carbonate and from 4 to 40 per cent. calcium sulphate.

Also, copies of reports of tests sent us by the Boiler Tube Cleaner Co., of Pittsburg, show that after a marked increase in the efficiency of the boiler the scale has been removed. In one case the gain was 16.3 per cent. and in another 24.8 per cent.; the thickness of the scale was not stated.

The Victoria Lumber & Manufacturing Company, Victoria, B.C., expect to ship a large quantity of lumber to South Africa after the cessation of the war here. During the past three months they have shipped large cargoes to that market, and other vessels are now loading at their mills at Chemainus.