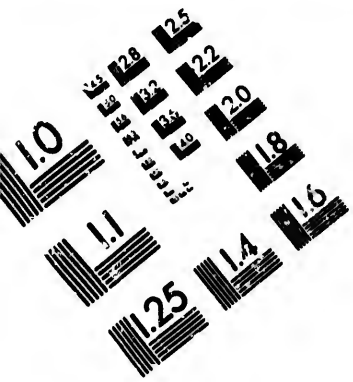

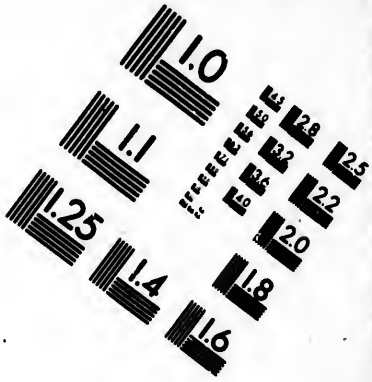

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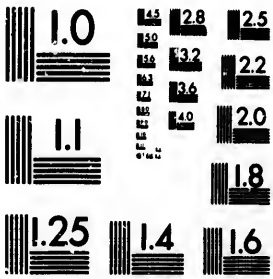

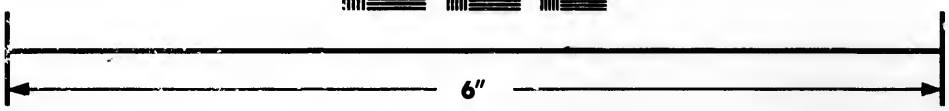

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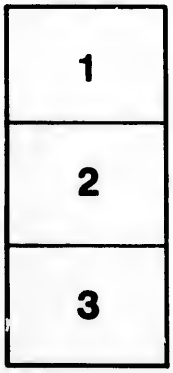

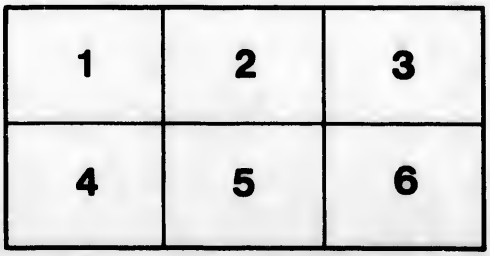

PROSPECTUS.

PATENT

WOODEN RAILWAY.

TORONTO:
BROWN'S PRINTING ESTABLISHMENT, KING-STREET EAST.
1853.

PROSPECTUS

OF

PATENT WOODEN RAILWAY.

THE object of the Proprietors of the Patent Wooden Railway is, to place before the Public the many advantages in Railway locomotion to be obtained by the substitution of *Wooden* for Iron Rails according to their system, and to demonstrate its durability, economy, and power.

This system consists in the preparation of the Timber to be used according to the Patented process of Charles Payne, of London, against "*wet and dry rot, the attacks of Insects,*" &c., and the application of Valentine's patent "Guide Wheel and Wooden Rail."

The adoption of the wooden rail, resting on a great frame-work of wood, is undeniably a recurrence to the wisdom of our ancestors; but under such peculiar modifications as made such recurrence eminently desirable, especially in a climate of such sudden extremes as that of America. These modifications are, firstly, the chemical transmutation of the fibres of the wood into a more durable, hard, and impenetrable substance.

Secondly, the employment of Valentine's patent guide wheels, before and behind each carriage, as a substitute for the flange, which is a main cause of the wear and tear on the existing Railways. By means of the guide wheels, the carriage wheels would be quite flat, obviating all abrasion of the wood, without producing oscillation, and under such circumstances each wheel would act independently, as with the wheels of ordinary carriages, and Railway travelling rendered smooth and noiseless.

By the process of Paynizing the wood becomes prepared to resist the action of wet and dry rot, impervious to the attacks of Insects, and is rendered much less inflammable. It is effected by placing the Timber in an air-tight cylinder, and by exhaustion and pressure forcing into its pores Sulphate of Iron and Lime in solution. When these two salts come into contact, they decompose each other, and produce an insoluble substance, permeating and fossilizing it.

The great advantage of wood over iron, presuming its durability to be the same, is the adhesiveness of its surface, involving about double the tractive power of Iron. Much fallacy existed on this subject, which has been expelled by recent and numerous experiments in England.

This objection was based on a confusion of friction with adhesion, which is increased by the mode of cutting out the Rails at an angle of forty-five degrees with the direction of the fibres of the wood. Upon an iron rail the weight is necessarily increased in an inordinate

degree, to counterbalance the want of adhesiveness of surface. If the Engine was prevented from moving forward by some unmovable obstacle, and was also powerful enough to overcome the adhesion, the wheels of the engine would revolve even though the carriage made no progress. If the obstacle was diminished, so that it would give way before the adhesion was overcome, the engine would advance. The magnitude of the obstacle which can thus be removed is to be measured by the amount of adhesion; for if the resistance is greater than the adhesion it will not be removed. The total amount of resistance to progress is correctly represented by such an imaginary obstacle, and there is an amount of train, which an engine of a given weight will not draw, whatever its power, for its wheels will rather revolve than draw the train. This adhesion, and therefore source of tractive power is, with *Iron wheels* on a *Wood surface*, found to be *double* that of Iron: in ascending an incline, the engine has not only to draw but to lift.

Increase the bite or adhesion, and you may increase the steepness of the gradients, and greatly diminish the weight of your carriages, which, as well as the engines, will certainly (from the resilient character of wood) last twice as long, with greater smoothness and less noise, than if worked on iron rails. Thus, an immense saving may be effected in cuttings and embankments, as well as in the carrying establishment and in the locomotive power.

The Red Beech, or Sugar Maple, so abundant in many parts of the United States and Canada, is preferred for

the *rail*, from its toughness, specific gravity, hardness, and non-liability to laminate. Any "Paynized" timber may be used for the other works.

Experiment has shown that the prepared Beech has recovered the deflexion of three-eighths of an inch, resulting from a pressure of 140 tons upon the tire of a wheel; and that it is stronger than Oak in the ratio of 103 to 100; and upon an experimental Railway in London, carriages had passed over it *twenty-eight thousand* times (equal to seven years' traffic) without obliterating the saw marks, and *thirty-seven thousand tons* of goods were transported without any perceptible effect.

In like manner, it was ascertained that curves of 700 feet radius, and less, can be rapidly traversed without the possibility of the engine running off the rails, from the peculiar construction of the wheels; and gradients of 1 in 9, 1 in 24, and 1 in 95, were overcome, without any previous impetus, by the steam being turned on at the commencement of the incline: the break, too, was constantly in use, without producing the least abrasion.

The following is the result of experiments, showing the superiority of "Paynized" over unprepared timber. At a bearing of 2 feet 10 inches, a piece of Pine 1 inch by 1 inch, under a pressure of 6 inches, bore 7 lbs. more than the unprepared piece (similar in all other respects); $1\frac{1}{4}$ inches by $1\frac{1}{4}$ inches, 28 lbs.; and $1\frac{1}{2}$ inches by $1\frac{1}{2}$ inches, 70 lbs.

The quantity of timber and material necessary for one mile of "Paynized" wooden rail, chairs, sleepers, &c., as

designed by John S. Valentine, Civil Engineer, suitable to his patent guide-wheel, is as follows:—

2640 Cubic feet Red Beech in rails, 5 x 5 in the clear; 6 x 6 including waste.

1320 Cubic feet longitudinal chair of White Pine, 2½ x 2½, or 3 x 3 with waste.

4436 Cubic feet longitudinal sleepers, 5½ inches by 11 inches, White or Yellow Pine.

587 Tie-struts, 9 feet apart, 5 inches by 4 inches by 5 feet, 4 feet 8½ inches guage, 391 Cubic feet.

587 Transverse sleepers, 6 inches by 9 inches by 10 feet, 2199 Cubic feet.

3520 Iron bolts, with nuts.

1174 Wooden keys to transverse sleepers.

The advantages, then, and superiority of Railways upon this system, may be summed up thus:—As rendering unnecessary heavy embankments, fillings, cuttings, and tunnels;—as the means of securing cheap fares;—as greatly reducing the annual maintenance;—as greatly diminishing the cost of construction to formation level, by admitting sharper curves and steeper gradients;—as greatly lessening noise, and producing greater safety, ease and comfort in travelling;—and as preventing the possibility of accidents by the breaking of wheels or axles, or by the engine running off the rail.

Toronto, February 15, 1853.