

the whole of such plan shall be upon a scale of not less than $\frac{1}{4}$ in. to every 100 ft., an enlarged plan shall be added of any building, yard, courtyard, or land within the curtilage of any building, or of any ground cultivated as a garden, either in the line of the proposed work, or included within the limits of the said deviation, upon a scale of not less than a quarter of an inch to every one hundred feet.

41. In all cases where it is proposed to make, vary, extend, or enlarge any cut, canals, reservoir aqueduct, or navigation, the plan shall describe the brooks and streams to be directly diverted into such intended cut, canal, reservoir, aqueduct, or navigation, or into any variation, extension, or enlargement thereof respectively, for supplying the same with water.

42. In all cases where it is proposed to make, vary, extend, or enlarge any railway, the plan shall exhibit thereon the distances in miles and furlongs from one of the termini; and a memorandum of the radius of every curve not exceeding one mile in length shall be noted on the plan in furlongs and chains; and where tunnelling as a substitute for open cutting is intended, the same shall be marked by a dotted line on the plan, and no work shall be shown as tunnelling in the making of which it will be necessary to cut through or remove the surface soil.

43. If it be intended to divert, widen, or narrow any public carriage road, navigable river, canal, or railway, the course of such diversion and the extent of such widening or narrowing shall be marked upon the plan, and, if it be intended to divert any public footpath, the course of such diversion shall be marked upon the plan.

44. When a railway is intended to form a junction with an existing or authorized line of railway, the course of such existing or authorized line of railway shall be shown on the deposited plan for a distance of 800 yards on either side of the proposed junction, on the same scale as the scale of the general plan.

45. In cases of bills for improving the navigation of any river, there shall be a section which shall specify the levels of both banks of such river; and where any alteration is intended to be made therein it shall describe the same by feet and inches, or decimal parts of a foot.

46. In every section of a railway the line of the railway marked thereon shall correspond with the upper surface of the rails.

47. Distances on the datum line shall be marked in miles and furlongs, to correspond with those on the plan; a vertical measure from the datum line to the line of the railway shall be marked in feet and inches, or decimal parts of a foot, at the commencement and termination of the railway, and at each change of the gradient or inclination thereof; and the proportion or rate of inclination between every two consecutive vertical measures shall also be marked.

48. Wherever the line of the railway is intended to cross any public carriage road, navigable river, canal, or railway, the height of the railway over or depth under the surface thereof, and the height and span of every arch of all bridges and viaducts by which the railway will be carried over the same, shall be marked in figures at every crossing thereof; and where the railway will be carried across any such public carriage road or railway, on the level thereof, such crossing shall be so described on the section; and it shall also be stated if such level will be unaltered.

49. If any alteration be intended in the water-level of any canal, or in the level or rate of inclination of any pub-

lic carriage road or railway, which will be crossed by the line of railway, then the same shall be stated on the section, and each alteration shall be numbered; and cross-sections, in reference to the numbers on a horizontal scale of not less than 1 in. to every 330 ft., and on a vertical scale of not less than 1 in. to every 40 ft., shall be added, which shall show the present surface of such road, canal, or railway, and the intended surface thereof, when altered; and the greatest of the present and intended rates of inclination of the portion of such road or railway intended to be altered, shall also be marked in figures thereon; and where any public carriage road is crossed on the level, a cross-section of such road shall also be added; and all such cross-sections shall extend for two hundred yards on each side of the centre line of the railway.

50. When a railway is intended to form a junction with an existing or authorized line of railway, the gradient of such existing or authorized line of railway shall be shown on the deposited section, and in connection therewith and on the same scale as the general section, for a distance of 800 yards on either side of the point of junction.

51. Estimates and deposit of money and declarations in certain cases.

52. An estimate of the expense of the undertaking under each bill of the second class shall be made and signed by the person making the same.

Modern Track Tools and How to Use Them.

In writing on this subject I realize how important a matter it is to care for and use tools correctly. I will take the hand car. Its use is to carry men and tools to and fro; also light material. As to the care of hand car I would not overload it at any time nor carry unnecessary tools or material; keep it well oiled and lost motion corrected; would set it off and on track if force is large enough; if not I would turn it off. My way of putting car on track is as follows: One man and foreman constitutes the gang; I use a piece of crossing plank 14 ins. long by 8 by 4; adze it down to $\frac{1}{2}$ in., this will give it a raise of $3\frac{1}{2}$ in. When ready to put car on track pull rear wheels inside of track. Place frog inside of rail; go to front of car, pull around until wheel strikes frog and mounts the rail, then pull the other wheel on track. Two men can put the car on track as easy as four men and just as quick. The old way of pulling car over rails is very hard on the car. Don't place frog parallel with rail. But place one end close to rail, the other 5 inches away so as when wheel mounts the rail it will have full flange bearing and will not crowd over rail while the other wheel is mounting the opposite rail.

The track level is used in leveling track. It should be accurate, no matter how turned or what way you use it. For levelling curves: Know the proper elevation and set level board in accordance. A level board that is not true should not be used; they are very costly if used. Think of a surfacing gang using an untrue board, say $\frac{1}{2}$ in. of level for one season. It would take half of the next season to level what should have been done in the first place. The results are the same on sections, use a poor level two years, then use a true level, note the result. Half the track is $\frac{1}{2}$ in. low. All track levels should be tested before being sent out for use.

The track jack is used principally for raising track. It can be used for lining track, and can also be used around wrecks to good advantage for jacking tars over and clearing track. For rais-

ing track always place jack outside of rail in an upright position, to avoid throwing track out of line, and for safety.

The claw bar is used to pull track spikes. It should be made of good material, claws well hollowed out with high heel to pull spike straight up out of ties. Claw bars with low heel should not be used; they pull the spike over and tear part of the tie with it. I think the heels of claw bars should have sharp raised grooves to hold bar from backing away while spike is being pulled.

The tamping bar is used to pack all kinds of ballast under ties; it should have a well shaped blade of good steel, 4 by $\frac{1}{2}$ in. thick or less; the upper end should have a blade 6 by 1 by $\frac{1}{4}$ in., slightly sharpened to clean surplus ballast from ties to be tamped. The tamping end should be well curved and the handle bent to balance. To get the best results the operator should stand as low as possible, so that tamping blade will drive ballast well under the ties; tamping ties with bar too straight will not drive it under but down, which will do no good to track.

Spike pullers are used to pull spikes where claw bars cannot be used. The ones in use are good, but could be made a little wider at the opening.

Cold chisels are used for cutting small pieces of iron; they are good for marking steel rails that are to be cut with track chisels; should be sharp and carried on car at all times.

Sledges are used for driving fence posts. Are also good to maul joint ties down to surface, but it is best to cover tie face with a large solid piece of elm or some tough wood to avoid bruising its face.

Track gauge is used for gauging track. Can also be used for leveling straight track; in cases of necessity place gauge on track with a small 10-in. level on top; this will do very well. Can also be used to square ties across track. In spiking new ties, place track gauge on track, gauge centre on tie centre, drive the other end to gauge, centre and tie will be square across track, either on curve or straight track.

The tape line is used for measuring anything you wish, but I would condemn the use of the common cloth tape line; nothing but the steel tape should be used, if accurate measurements are wanted, especially for rail measure.

Track drills, lining bars, pinch bars, in fact all track tools should always be kept in the very best of condition. No two men use the same tools alike. In fact a very small per cent. of laborers know how to use all tools correctly. Railway companies should furnish the best of tools to their employes and they in turn would take better care of them, especially the pick and shovel. To describe how to use them is a hard proposition. Volumes could be written on this subject and very little accomplished. I make a business of keeping all edge tools sharp, and all other tools in good condition. By "Rail Joint," in Roadmaster and Foreman.

Cross-wall Railway Bridge, Quebec.—The railway bridge which the Quebec Harbor Commissioners are about to build, is at the entrance to the wet dock of Princess Louise Embankment and docks. The superstructure will consist of a single leaf, single track bridge of the bascule type, having a clear span of 74 ft. 4 in., and giving 22 ft. headroom. The trusses will be 22 $\frac{1}{2}$ ft. centre to centre. The bridge will give connection between the railway tracks on the two sides of the wet-dock and tidal basin. The contract has been given to the Dominion Bridge Co., Montreal.