water from the uplying land. On hills the course of the water may be arrested in the open drains at short intervals and caused to enter the tile through catchbasina, thus over-covering the wash of excessive and rapid flows of surface water. The traffic of winter often forms a channel for the water in the centre of the road, and in the spring before frost leaves the surface of the road the pathmaster should examine every hill and see that the gutters are free from obstruction of snow and ice. If this is neglected, constant and expensive repairs will be necessary.

Water in "springy" places on a roadbed should be conducted by drairs from the centre of the road diagonally to the side under-drains. Springy places on a hillside embankment should also be tapped by a blind drain, and the water led quickly to the tile drains.

Take the water out and keep the water out.

## FORMING A ROADBED.

In making a road the grading and draining should be carried on during the same season, first the draining, then the grading. A road which is graded only, and then subjected to the traffic of fall and spring before draining is undertaken, is generally a shapeless mass by the ensuing summer, and a large amount of grading must necessarily be repeated. A road should also be drained and brought to the grade which it is to retain permanently before the road metal (gravel or crushed stone) is placed on it. Metal placed on an undrained roadway is so mixed with mud in the spring and fall as to be almost wasted. The natural soil under the gravel must be sufficiently firm to sustain not only the gravel, but the weight of traffic upon the gravel. No soil will do this unless it is sufficiently drained.

The roadway must be crowned, or rounded up towards the centre, to shed the water from the surface; the surface must be kept smooth and free from tracks, and it is as much the duty of gravel or crushed stone placed on a road to form a smooth, hard surface that will permit the water to flow readily off from it, as it is to form a durable covering to resist the wear of wheels.

The centre of the road should be excavated to receive the gravel or crushed stone. Where this care cannot be taken the metal may be placed on the centre and the sides graded up. The crown of the road should be obtained chieffy by rounding up the natural soil, but the metal should be several inches deeper in the centre than at the sides. On country roads, a crown of one inch rise to one foot of width from the side to the centre is generally sufficient; on hills it may be greater so as to prevent the water following the wheel tracks and deepening them to ruts.

The width of a roadway to be metalled depends upon the amount of traffic it will be required to accommodate. Eight feet will be ample for the majority of roads in rural districts. Roads forming the approach to towns may sometimes be metalled to a width of sixteen feet. The depth of metalling need never exceed after consolidation twelve inches, if of a good quality and clean, and eight inches is the least which should ever be employed, the thickness varying with the amount of traffic. It should be placed on in layers, and each layer thoroughly rolled, the subsoil baving first been well consolidated.

After the work of forming the roadbed has been completed, a great deal may be done toward levelling the sides, seeding, planting trees, etc., and not until the road allowance between the fences is brought to a right condition, should the road be considered finished. No investment offers better returns than the building of good roads.