covered be carortable cadam, vel for ders of weath-

softer r, need screengravel

better ng the

water l from Wheels ut not ch suc-

neath, in dry

ehicles

t, it is e year, cut off ds are areful expend out, hould

ollers olling. recau-

—the d, the

e kept more er in s does 9

Gravel and limestone bind more easily than the better varieties of granite and trap, and a lighter roller may be used with good effect.

If the bridges are old-time wooden structures, if the road mileage on which work is to be done is not very great, if the material used is not trap or similarly hard metal, a horse roller of from five to eight tons may be used. The work of a horse roller, however, is not so perfect as that of a steam roller. The feet of the horses disturb the metal, and the lesser weight requires that the rolling shall be continued very much longer.

Rolling should commence at the side of the road, approaching the centre gradually. If the roller is first passed over the centre, the loose metal is crowded out and the shape of the crown destroyed. It is best to roll the earth foundation in dry weather, and each succeeding layer up to the top dressing. When the latter is put on, the rolling should be continued in wet weather, or the metal thoroughly soaked with an ordinary watering cart. When finished the road should be thoroughly compact and solid, able to resist without displacement the heaviest load passing over it. Extra labor and expense in the first construction of gravel or macadam roads is more than made up by the decreased cost of maintenance. Bad roads are expensive.

## TIRES.

It is not only necessary to make good roads; it is also necessary that they shall remain good. For this leason all European countries advanced in roadmaking, have laws regulating the width of tires used on wagons, carts and vehicles for heavy draught.

In France the width of tires ranges from three to ten inches, usually from four to six. Every market wagon and tonnage wagon is a roller; the forward axle is about fourteen inches shorter than the rear axle, so that the hind wheels run in a line about an inch outside the level rolled by the fore wheel.

In Germany, wagons used for drawing earth, brick, stone and similarly heavy loads must have a width of tire at least four inches.

In Austria all wagons built to carry a load of more than two and one-quarter tons must have tires at least four and one-third inches in width. In lower Austria a rim of four and oue-half inches is required for wagons drawn by two horses.

In the State of Michigan persons using wide tires receive a rebate of onefourth their road tax. The States of New York, California, Ohio, Indiana, Kentucky, Vermont, Pennsylvania, Massachusetts, Connecticut have laws pertaining to the width of tires.

Experience goes to show that broad tires are very much to be preferred for drawing loads through fields and on farm roads, as they sink less deeply into the soft earth and employ less draught to move them. On rough, rutted roads, the advantage is slightly in favor of the narrow tire in point of draught, but when wide tires are used by all there will be no rutted roads. One farmer using tires as narrow as four inches says that in the spring time he has only to drive up and down his lane a few times to change it into a smooth, level driveway. Those who will observe the occasional wide track made on our country roads will understand this result.

Towns and cities are no less affected by narrow tires than are rural districts, and it is little short of absurd that property owners should go to the expense of aying expensive pavements while those most benefited continue to destroy them