the difficulty by the use of tar macadam roads. These are constructed with the same kind of base, etc., as for ordinary macadam, but the surface or wearing coats or layers have a tar and paving pitch cement mixed in certain proportions and under certain variable conditions to meet the special case being dealt with. Much greater care is needed in grading the stone as to secure a mixture with the minimum of voids so as to form as nearly as possible a perfectly cemented mixture. This when properly rolled makes a smooth waterproof surface which can be readily cleaned and thus remove to a certain extent the objection because of dust. These roads have not, however, been a success on business streets or on streets subjected to any degree of heavy traffic, which streets require a surface which combines smoothness, cleanliness, a good foothold for traction purposes, a moderately permanent wearing surface, and of such material as will admit of easy and economical repair. In cities this is best met by using sheet asphalt, but in smaller cities and towns which have no permanent paving plants the preferable materials are brick, treated wood blocks and asphalt blocks. These all have similar foundations and differ only in the treatment of the wearing surface material.

BRICK PAVEMENTS.

A good brick must be tough enough to resist wearing, but not brittle enough to chip under the concussion of horseshoes or grind under heavy traffic. It must also be close grained and compact and sufficiently annealed to prevent any appreciable absorption of water, an excess of which would rapidly disintegrate the brick in the process of freezing and thawing and also in making the brick soft and liable to crush under traffic. These brick should be of the largest size which will permit of the proper burning and annealing in the making so as to not leave unburnt centres which will absorb too much water. They should be made with proper contrivances to ensure a uniform spacing in laying so as to permit sufficient grouting to be used to make a united surface and should be true and even on the surface to ensure as noiseless a pavement as possible. A brick pavement has many advantages in being sanitary, easily cleaned, affording a good hold for traffic purposes, being readily repaired and being moderately cheap. It is, however, noisy and, unless properly laid and grouted, the bricks "cobble," and the wear and noise increase very rapidly and the pavement is soon destroyed.

WOODEN BLOCKS.

Treated wood blocks are used very generally in many English and European cities, but, curiously, not here, mainly because of the lack of suitable wood near at hand and also because of the lack of experience with reference to this special class of pavement. When properly selected, treated with a good preservative and laid with care, this is almost an ideal pavement, as it combines most of the good features of the brick without the objectionable ones. The great drawback is the unsanitary conditions liable to arise if not properly kept clean, and this is no fault whatever of the pavement, but of its treatment. At present the cost is rather high, but it seems strange that some suitable Canadian wood cannot be secured to answer the requirements necessary for this class of roadway.

ASPHALT BLOCKS.

Asphalt blocks have had a varied experience, due entirely to the imperfect methods of making the blocks. These are made of a mechanical mixture of small stone chips, sand, dust and an asphalt cement, the block being moulded and subjected to a very strong pressure while the materials are hot, similar to the rolling process of a sheet asphalt pavement, one being done at a factory and the other on the street. There is no reason why the blocks should not be satisfactory if properly and carefully made, and the resulting pavement has many good features and combines practically all those of the brick and treated wood blocks. The only drawback is the liability to rot under conditions of undue moisture, which difficulty can, however, be easily removed by seeing that the surface is even and has a proper amount of "crown" and "grade" to quickly drain off the water and prevent any trouble from moisture.

All of these three pavement surfaces are not laid directly on the concrete foundation, a cushion coat being supplied for the purpose of permitting the blocks to be rolled to a true, even surface, and also to prevent any sudden concussion or heavy concentrated load from crushing individual bricks or blocks resting on the hard, uneven concrete surface.

The spaces between the bricks are filled with a cement grout to prevent water causing trouble and to keep the blocks tight in place to prevent chipping and undue wear.

With wood blocks and asphalt blocks a sand filler seems to be preferable because the traffic hammers or beats down the surface of the blocks and a more uniform homogeneous surface is secured than when a cement filler is used which would isolate each block from those surrounding it.

All of these pavements described are suitable for business or residential streets under all conditions of traffic, the only difference being the treatment of the foundation to bear heavy or light loads as the case might be.

But no pavement will be a success unless it be constructed on sound engineering lines and principles and is properly cared for after its completion. A proper attention to cleanliness and repairs will aid in maintaining a roadway in good condition which would rapidly fail with neglect.