The road is 18 ft. wide, with a 3-ft. asphaltic macadam (penetration method) shoulder on each side, making a total width of 24 ft. The contract price was $1.10 per square yard for the asphaltic macadam mixed method, and 90 cents per square yard for the asphaltic macadam penetration method, or a total of $14,784 per mile.

Before the work was begun, adequate side ditches were opened and properly graded so as to carry all water

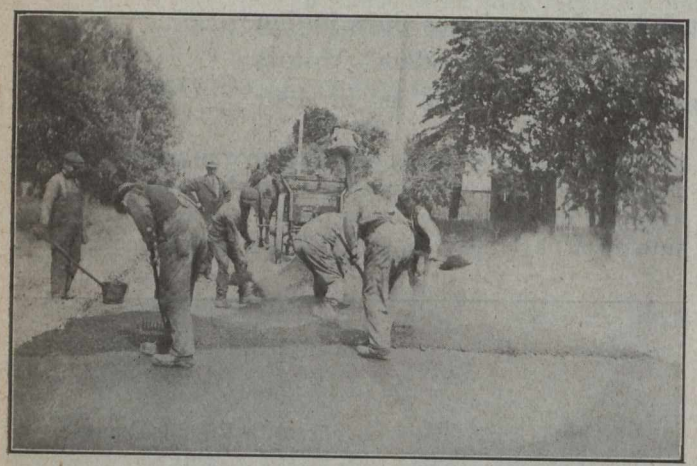

Fig. No. 3.—Raking the Hot-mixed Material with Hot Rakes. Material in Foreground Has Been Rolled

from the road allowance. The old road was thoroughly scarified for its full width and length and to a depth of about 4 inches. The loose stone left by the scarifier was harrowed and graded, the crown of the old road being lowered and the road widened. A 2-inch layer of fresh, clean stone was then spread, and asphalt (heated to between 200 and 300 degrees F.) was applied uniformly over the surface by hand sprinklers as a binder course, using between ½ and ¾ Imperial gallons of asphalt per square yard of surface. While the asphalt was still hot and plastic it was rolled with a 10-ton three-wheel steam roller until the course was thoroughly compacted and the surface true and even, conforming to the established grade and contour of the finished surface of the road.

The top course was laid so that when finally compressed and completed it had a uniform thickness of not less than 2 inches. The top course consists of a mixture of crushed stone, sand and limestone dust, to which was added asphaltic cement in sufficient quantity to coat thoroughly the particles composing the mixture and so as to fill all voids and produce a slight excess on the surface of the pavement after being thoroughly rolled. The materials composing the top course were mixed in the following proportions by weight:—

Stone (½-inch), 48 to 60 per cent.
Sand, 36 to 20 per cent.
Dust, 6 to 12 per cent.
Asphaltic cement, 10 to 8 per cent.

The stone and sand were heated to a temperature between 300 and 400 degrees F., and were thoroughly mixed with the mineral dust in a standard portable one-car asphalt plant, which was operated first at Lambton, at the east end of the work, and later moved to a C.P.R. siding at Islington, a distance of about one mile from the easterly end of the work and about three miles from the westerly. The mixture of stone, sand and dust was further mixed with asphaltic cement heated to about 250 degrees F. so as to produce a thoroughly homogenous mass, with all of the mineral aggregate covered with asphaltic cement. This mixture was immediately carried to the road in wagons properly protected from radiation and was applied at a temperature of about 300 degrees F. It was found that the temperature of the mixture did not at any time drop more than 10 degrees between the plant and the job. After being unloaded on the road, each load of the mixture was shovelled into place in such manner that the whole of it was moved promptly from the pile into which it was unloaded. It was then spread with hot rakes, great care being taken that all lumps were thoroughly broken up and the whole surface carefully spread to such depth as would insure a thickness in all places of at least two inches when ultimately compressed. The rolling was started at the side and continued towards the centre until there was no more movement of the bituminous surfacing ahead of the roller. Care was taken that no more of the binder course was laid at any time than would be covered with the top course within an hour.

After the surface of the pavement had been well rolled so that it was even and true without waves or depressions, a thin coat of asphaltic cement (from 1/5 to 1/4 Imperial gallon per square yard) was squeegeed over the entire surface, including the inner six inches of each shoulder. While this coat was still hot it was evenly covered with a thin layer of clean, sharp, hot sand, rolling then being continued.

New stone was used for the shoulders, about 1½ Imperial gallons per square yard of asphaltic cement being applied by hand sprinklers just before the squeegee coat was applied. The same asphalt was used for this penetration work as for the mixed method, but it was fluxed to a higher penetration. The shoulders were first rolled at the same time as the top course, and were rerolled together with the remainder of the road after the application of the squeegee coat and sand. The shoulders were sanded to the outer edges.

The contractor guaranteed the road for a period of three years from the date of acceptance by the Toronto and York Highway Commission, and agreed to make all necessary repairs and maintenance for that period.

Fig. No. 4.—Rolling the Top Course

Following is the specification which was used for the asphaltic cement for the penetration method:—

1. It shall be homogeneous and free from water, and shall not foam when heated to a temperature of 150 degrees centigrade.

2. It shall have a specific gravity at 25 degrees centigrade of not less than 0.98.

3. It shall have an open flash point of not less than 190 degrees centigrade.