In presenting a brief discussion of "Maintenance of Brick Pavements," I consider it desirable to first note the causes of failure. This may result from abrasion or wear of the surface due to the action of traffic; or it may occur from breaks or settlements because of inferior materials, poor foundation, improper design, or faulty workmanship.

Some of the very early pavements laid in this country were constructed of brick which were too soft to withstand the severe action of steel tires and metal shoes and as a result the surface eventually became so rough and disagreeable to traffic that, in many instances, it was torn up and a new one built. Pavements constructed in the last twenty-five years seldom require any extensive renewal or repair because of abrasion or inferior material, however, they do require maintenance because of foundation, design and workmanship troubles.

Defects are nearly always small at first but may rapidly increase in size if neglected. As soon as a fault appears the cause should be found and the proper remedy applied. Individual brick which have failed should be removed and replaced with good ones. Unless the failure is observed when it first occurs and the remedy applied, the adjacent surface will be affected requiring more extensive repairs. Therefore, in making a patch, the adjacent surface should be carefully examined for slightly worn brick. These should be turned over and relaid with the new ones, thus presenting a new and smooth surface to traffic.

Expansion joints should be kept full with the bituminous materials at all times so that the adjacent edges of the brick will be protected. They will require attention prior to cold weather as some of the expansion material will be squeezed out under hot summer conditions. An expansion joint is a point of weakness in the pavement and should be kept sealed to prevent the entrance of water to the base.

Where a sand cushion has been used, a settlement of the surface sometimes occurs. This may result from too little or no rolling of the sand, the sand flowing into a break in the base, or from water displacing the sand. The remedy consists in removing the brick over the depressed area, repairing the base if necessary, renewing the cushion and relaying the surface.

City pavements frequently suffer as a result of cuts made for gas, water or other public service connections. In making such
a cut the brick should be carefully toothed out over a width greater than the desired width of cut. The base should then be cut through with vertical edges over a width also more than the earth trench. The trench is next made, the service connection installed and the trench back filled. In filling the trench the earth should be dampened if necessary and carefully tamped in layers not to exceed 6 inches deep. The base and top are then restored in order. The shoulders of subgrade and foundation respectively afford a safety factor against settlement of the base and top.

On old pavements where the filler has been partially removed by traffic and weather action, it may be restored and the pavement protected by an application of asphalt or tar. A low penetration material, either cut back or heated, should be used. It should be covered within a few minutes by a thin coating of clean, coarse sand. Traffic should be kept from the street for a few hours. If this is not possible one half of the street may be treated at one operation and the remainder completed next day.

Old surfaces that are badly cobbled and rough may be resurfaced with sheet asphalt, bituminous concrete, penetration macadam or rock asphalt. The surface should first be carefully cleaned by sweeping or flushing or both. Low spots may be filled to an approximate level with the general surface of the pavement with portland cement concrete or cold patch material. If cold patch material is used it should be tamped or rolled in place and carefully proportioned to avoid a too rich mixture. The entire surface of the street is then given a paint coat of tar or asphalt depending on the material to be used in the bituminous top. The binder or top may be applied when the paint coat no longer leaves a stain when the finger is pressed against it. The surfacing material should not be less than one inch in thickness over the high points. Two inches will be better if sheet, emulsified or rock asphalt is used, while a penetration top should be two and one-half to three inches in depth.

In closing, I may say that the fundamentals of economical maintenance are constant vigilance and immediate correction or repair of all faults appearing in the pavement.