To all whom it may concern:  

Be it known that I, Tamekichi Ito, a subject of the Empire of Japan, residing at No. 88 Akagishitamachi, Ushigome-Ku, Tokyo, Japan, have invented certain new and useful Improvements in Paving Stones, of which the following is a specification.

My invention relates to improvements in concrete paving-stones.

The invention comprises as one of its objects the forming of a groove horizontally along the middle of each longitudinal side of a rectangular-shaped paving-stone, and that the side above the groove is slightly and evenly removed, so that the width of the upper part of the paving-stone is a little less than that of the lower part, and, by this arrangement any two adjacent stones of the pavement form an under-drain consisting of two grooves above the surface where their lower parts come to contact and also form a vertical narrow channel leading from the surface of the pavement to the said drain, whereby the rain-water on the pavement may be readily drained; while, if necessary, sands may be arranged in the drains and channels, whereby the accumulation of dirt in the drains is prevented and the propagation of sound being considerably prevented, vehicles are made much less noisy, and at the same time, as the sands can contain water, the surface of the pavement after watering is kept wet comparatively longer.

The invention further consists in the shaping of the surface of the paving-stone in a convexed curvature, and in removing a part of the mixture, i.e., cement and sands, etc., from the surface to expose a part of the pebbles, whereby slipping on the surface of pavement and splashing of water when raining or when the surface is being watered may be prevented.

The invention also resides in the forming of the upper zone of the paving stone of concrete composed of hard pebbles, sands, kieselguhr and Portland cement, and the lower zone is of concrete composed of gravels of lava, sands and Portland cement, whereby the paving-stone is rendered stronger and lighter than other paving-stones formed of ordinary concrete.

The accompanying drawings illustrate the construction of the paving-stone of this invention, wherein Figure 1 is an end elevation showing the arrangement of two paving-stones; Figure 2 is a side elevation thereof; Figure 3 is a perspective view thereof; and Figure 4 is a perspective view showing a paved street.

The paving-stone of this invention is in the form of a rectangular body made of concrete, and provided with a V-shaped or other suitably shaped groove (1) arranged horizontally along the middle part of each longitudinal side, so that when these stones are paved, any two adjacent stones form a substantially square or other suitably shaped under-drain consisting of two grooves (1) (1) above the surface where their lower parts come to contact. The width of the paving stone in the part (2) above the groove, is reduced by removing that part slightly and evenly, so that when the lower parts (3) (3) come to contact, the upper parts (2) (2) leave a narrow space between them, which forms a vertical channel leading from the surface of the pavement to the said drain.

The upper surface (4) of the paving-stone has a slightly convexed curvature so as the water will not stay thereon. In this connection it is to be observed that when the stone has been moulded it is removed from the mould and before the concrete is fully hardened a flow of water is poured upon the surface of the product and a part of the mixture consisting of cement and sands, etc., is washed away to expose a part of pebbles included in the concrete, thereby preventing an anti-skidding and anti-splashing surface.

This paving-stone may be moulded from ordinary concrete, but, as shown in the drawings, the upper zone (5') is preferably formed of the concrete composed of pebbles, sands, kieselguhr and Portland cement, these, say, being mixed together in the proportion of 4.0, 2.0, 0.2, and 0.8, and the lower zone (5) is preferably formed of the concrete composed of gravels of lava, sands, and Portland cement, these, say, being mixed together in the proportion of 5.0, 2.5, and 1.0. Further, if necessary, a suitable reinforcing member (6) may be arranged transversely and longitudinally through the body of concrete.

To prepare for the pavement, as shown in Figure 4, sands (8) are first laid on the road, of which the base is made sound by
pebbles, gravels or concrete (7), and then the paving-stones are transversely and longitudinally arranged in close succession in the right angled direction to the road.

Thus one set of the grooves (1) are connected with one another in a straight line, and other sets form a number of similar underdrains parallel to one another, each being at right angles to the direction of the road. The rain-water flows downwardly along the curvature of the upper surface (4) of each paving stone, and passing through the vertical channels formed between the upper parts (2) (2) enters into the said under-drain, and is discharged into a sewer according to the slope of the road, while if desired, sands may be arranged in the said under-drains at the time when the stones are paved.

Having thus fully described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a pavement, a plurality of stones each including a rectangular body having a V-shaped horizontal groove arranged in each longitudinal side and having the portions of the longitudinal sides above the grooves reduced, the lower portions of the longitudinal sides of each stone being adapted to intimately contact with the corresponding portions of the adjacent stones while the grooves and reduced sides are positioned opposite each other to form a draining passage, and the upper surfaces of the body of each stone being curved convexly, substantially as and for the purposes set forth.

2. A pavement of the kind defined in claim 1 wherein the stones are arranged in transverse parallel rows so that the drainage passages are in alignment with each other transversely, and an absorbent packing arranged in the grooves and facilitating the locking of the stones together.

In testimony whereof I have affixed my signature in presence of two witnesses.

TAMEKICHI ITO.

Witnesses:
Kwan Ichi Rawo,
Edward C. Wynne.