

factory cover. Its top should be at formation level, and the formation should rise from this flag towards the side walls of the tunnel, this rise to be about 6 in.

Bench marks should be plainly indicated opposite one another on the side walls, from which the height of the soffit at various points may be ascertained soon after the arch is turned. By renewing these measurements, any sinking or settling of brickwork can be noted.

## REVISION OF UNITED STATES ROAD LAWS.

**R**OAD laws which have been on the statute books of various states of United States for more than one hundred years will probably be repealed as a result of the movement which has been inaugurated by the American Highway Association in conjunction with the American Bar Association. The committees appointed by the two associations have had prepared through the co-operation of the U.S. Office of Public Roads a complete literal compilation of the road laws of all the states, as well as the laws relating to indebtedness, the use of convict labor, and various other subjects which have a bearing upon the management of the public roads. An index chart for these various laws is now being prepared and as soon as it is completed the committees will determine upon the lines along which revision will be sought. The governors of the various states will then be asked to recommend to the legislators the appointment of special committees to confer with these committees with a view to adequate revision of existing road laws.

The first step in the revision of the state road laws will be to recommend that all obsolete, useless, or unnecessary road laws be repealed. The next step will be to simplify and arrange in logical order the existing necessary road laws. It has been found that in some of the states an accumulation of road laws running back over 100 years exists thus creating almost hopeless confusion. Certain basic features of good administration will be urged by the joint committees such as the payment of road taxes in cash; the elimination of a multitude of unnecessary road officials now characteristic of many of the states; the requirement of skilled supervision in the actual construction and maintenance of roads by providing qualification tests; the constant employment of highway engineers or superintendents; the adoption of the appointive rather than the elective method for such officials; the substitution of continuous maintenance for the present intermittent method; the proper utilization of convict labor where climatic and other conditions warrant its use on the public roads for the preparation of road materials; the general adoption of the principle of state aid and supervision; the proper safe-guarding and accounting of road funds.

Wherever practicable, uniformity among the road laws of the various states will be urged by the committees as it is realized that the traffic is now controlled by economic conditions rather than by state lines and should not be hampered by conflicting laws of the various communities.

It is expected that a most interesting report will be made by the joint committees at the Fourth American Road Congress which will be held at Atlanta, Ga., November 9-14, 1914.

## A NEW TRANSIT.

A new transit, called the "C. E. De Luxe," is being built by E. R. Watts and Son, Canada, Limited, of Ottawa. Among the interesting features appearing in the specification for this instrument, illustrated herewith, are the following:—

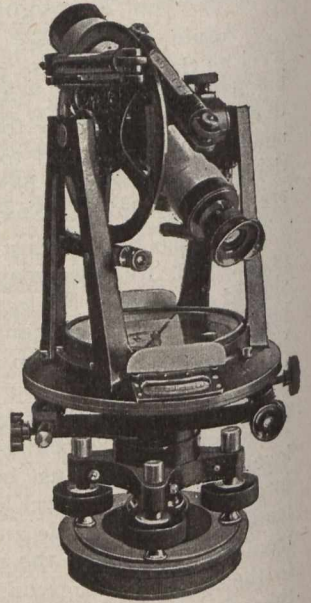
**Horizontal Circle**—Five-inch diam., reading to 30 seconds, graduated with two rows of figures, 0—360, both ways. One row of figures with the corresponding vernier is filled in with red, while the other row and vernier are filled with black.

**Bubbles**—The plate bubbles are enclosed in the compass, but are adjusted outside the compass by means of capstan headed screws.

**Telescope**—The telescope is made by Carl Zeiss, of Jena, and is fitted with their patent internal focusing arrangement, which gives absolutely accurate readings without the use of a constant.

**Foot-Screws**—The foot-screws are threaded on hard German silver, whilst the milled heads are made of hard rubber. The former admits of a fine thread and an easy motion. The hard rubber millings allow of a larger diameter head without increasing the weight, and are advantageous in extremely cold temperatures.

**Tangent Screws**—All tangent threads are cut in German silver. The upper plate, clamp and tangent screw milled heads are of a different shape to the lower clamp and tangent screw milled heads. This enables the observer to distinguish by touch which clamp and tangent he is using, whilst to further facilitate this point they are placed in such a position that even when wearing heavy mitts their distance from the plate denotes, without having to take the eye from the telescope, which clamp and tangent is being used.



A London engineer has recently compiled figures in an endeavor to throw light upon the vexed question of whether motor traffic is more injurious to road surfaces than is ordinary horse-drawn traffic. He takes as a basis of comparison the horse traffic periods of 1905-1906, and the motor traffic periods of 1911-12 which shows a decrease in annual cost per mile of roadway, for cleansing and scavenging, in the following six London districts: Battersea and Chelsea, \$540 per mile; Fulham, a decrease of \$5.30 per mile; Paddington, a decrease of \$620 per mile; Wandsworth, a decrease of \$470 per mile, and Westminster a decrease of \$895 per mile. A particular case of saving in up-keep cost is given in the example of a macadam road between Hammersmith and Barnes, which went on pieces under motor traffic. The Barnes district council spent \$47,000 in relaying this stretch with block paving, and a tabulation of expenses shows that not a single penny has been spent since then in repairs to the block paved road, although the motor traffic has increased at a very heavy rate. During the horse traffic period the cost of maintaining the macadam road was \$5,750 in 1906, and \$1,915 during the early part of 1907, in which year the road was relaid.