gauge, 60 wires forming one square inch of solid section; making the solid section of each cable 60.40 square inches, wrapping not included.

"Each of the four large cables is composed of seven smaller ones, which I call *strands*. Each strand contains 520 wires. One of these forms the centre, the six others are placed around it—the 520 wires forming one strand of endless wire, obtained by splicing a number of single wires. The ends of the strands are passed around and confined in cast-iron shoes, which also receive the wrought-iron pin that forms a connection with the anchor chains.

"The wire measures 18.31 feet per pound, and the strength, therefore, is equivalent to 1640 lbs. per single wire, or nearly 100,000 pounds per square inch.

"Assuming the above average strength, the aggregate strength of the 14,560 wires composing the four cables, will be 23,878,400 pounds. But their actual strength is greater, because the above calculations are based upon a *minimum* strength of the individual wires. We may assume their aggregate ultimate strength at 12,000 tons, of 2,000 pounds each.

"Both ends of the bridge rest upon the cliffs, and are anchored to the rock. As far as supported by the cables, I estimate its weight at less than 1000 tons, which includes the weight of cables between the towers, and the pressure of the river stays below.

"There are 624 suspenders, each capable of sustaining thirty tons, which makes their united strength 18,720 tons. The ordinary weight they have to support is only 1000 tons. A locomotive of thirty-four tons weight, including tender, spreads its weight, by means of the girders and trusses, over a length of no less than 200 feet. Of course the greatest pressure is under the engine, and is there supported by no less than twenty suspenders. If, by any accident, a sudden blow or jar should be produced, the strength of the suspenders will be abundant to meet it.

"A change of temperature of 100° causes a difference in the level of the floor of two feet three inches. The lower floor, or river stays have enough of slack, or deflection, to adjust themselves under these changes. The only difference will be, that they are tighter in winter than in summer; consequently, that the equilibrium of the bridge will be less affected by passing trains in cold weather than in warm.

"Droves of cattle are, according to the regulations, to be divided off into troops of 20, no more than three such bodies, or 60 in all, to be allowed on the bridge at one time. Each troop is to be led by one person, who is to check their progress in case they should start off on a trot.

"In my opinion, a heavy train, running at a speed of 20 miles an hour, does less injury to the structure, than is caused by 20 heavy cattle under a full trot. Public processions, marching to the sound of music, or bodies of soldiers keeping regular step, will produce a still more injurious effect."

The charge for passing over the bridge, on foot, is 25 cents—going and returning. Carriage $1.00, with 25 cents for each passenger inside.

The promenade, during a hot day, on the foot-path of the bridge, is deliciously cool, from the breeze which generally blows up or down the gorge of the river. The views looking towards the Falls, from different points on the bridge, are also exceedingly good, presenting to the stranger the picture of Niagara Falls, as they are represented in many engravings which are given of them, and even the best of them, after all, only can give a very faint idea of the great reality.

Suspension Bridge is the station where all the emigrant trains bound for the western states stay over—generally for some hours. Refreshment rooms to suit all classes are to be met with both inside and outside of the railroad station. Average charge, 25 cents per meal.