

the pointer to the two pound mark, after which it will settle and remain on the one pound mark.

Now, upon a bridge for common travel the maximum forces to be provided for are, the weight of the materials in the structure, and a crowd of men or other animals, all of which acts principally as so much dead weight. Hence, for such bridges, it is proper to consider the whole area of the road way, covered with men, which is about 100 lbs. to the square foot, as the greatest load to which the bridge can be exposed. The effects of such a load, upon the whole or any part of the platform, added to those of the weight of the structure, are the forces which the bridge should be calculated to sustain; and for that purpose, it is sufficient to provide in each part, 1 square inch cross section of good wrought iron to every 15,000 lbs. of tension to be sustained, and for thrust, to provide cast (or wrought) iron, according to the table for the safe practical strength of cast iron.

The methods of estimating the stress of the several parts of the structure, were given in full in the first part of this work.

In regard to rail road bridges, the enquiry naturally suggests itself, whether the ponderous engines and trains dashing over with lightning velocity, do not produce effects approximating to those of forces instantaneously applied? Doubtless some greater effect is produced upon some parts of a bridge by the rapid, than by the slow transit of a train. But with respect to the horizontal parts, (and the arch, in case of the arched truss,) which suffer their maximum strain under the full load of the bridge, sufficient time elapses between the first and the last portions of weight added, to obviate any tendency to mischief from the sudden application of force. With regard to the diagonals and the verticals, it is doubtful whether the same remark would not hold essentially true.

When the equilibrium of an elastic body is disturbed,