Iron Bridges.

rule; and, if on certain occasions it should be liable to that kind of action to a small extent, the stress should probably not be allowed to exceed 2,000 to 4,000 pounds to the square inch.

When exposed to compression, in pieces of such length as to break by lateral deflection, it is believed it may be safely loaded to one-third of its absolute capacity. If a long piece exposed to a negative strain have a defective part, it does not diminish its power of resistance to the same extent as when it acts by tension. The power of negative resistance being, in a measure, inversely as the deflection produced by a

100,000 lbs. on the end bolts, we have 156,000 lbs. sustained by 6 bolts of 1/4" diameter, containing 8.1 square inches, besides screw thread. This is a strain of 19,250 lbs. to the square inch with one track, and 55,322 lbs. with both tracks loaded with 2,000 lbs. to the lineal foot.

3. The East bridge over the creek in the south part of Troy, is a double track covered bridge with three trusses, having 8 panels of 12'8" each, or 88.66 ft sustained by the endmost suspension bolts. Say, of weight of structure bearing on end bolts of middle truss, 35,000 lbs. and 40 lbs. upon one track 88,660 lbs. on 4 bolts of 1/4" diameter and two of 1/2" diameter, having a net cross section of about 7.63 square inches. Hence the stress must be 16,156 lbs. to the inch, with one track loaded, and 22,750 lbs. with 2,000 lbs. to the foot upon each track.

4. The West bridge over the same stream, a few rods below the last mentioned, has three trusses containing 9 panels of 10 1/2 ft. each in length. It is a high truss bridge with roof and siding.

For weight of superstructure on endmost bolts of middle truss, say 28,000 lbs. and 40 lbs. upon one track 84,000 lbs. on 4 bolts of 1/4" containing a net section of 5.41 square inches, giving a tension of 20,702 lbs. to the inch for one track, and 36,220 lbs. for both tracks loaded with 2,000 lbs. to the lineal foot.

5. The bridge across the Erie canal near Canastota, on the N. Y. C. R. R., is a double track bridge with 2 trusses, which have 9 panels of 10 feet. If the superstructure be estimated to weigh 40 tons, it gives a little over 35,000 lbs. on the end bolts of each truss. Add 4 of 80 tons for 2,000 lbs. per lineal foot upon one track, and it gives 141,168 lbs. on 4 bolts of 1/4" diameter, and 5.41 square inches of net cross section; equal to 26,173 lbs. to the inch, with one track, and 36,044 lbs. with both tracks loaded.

All these cases are stated from personal examination by the author, except the last, which was reported to him from authority considered reliable. The cases were not selected, but taken as the most accessible and convenient for the author's observation. And still, he can not help regarding them as remarkable, and somewhat exceptional cases.