gular movement during the opening of the bridge is prevented, so long as the pressure on each roller does not exceed the amount mentioned; this is effected by bearings through which the spring presses against the cross girder below with a force of five tons, so that the load are taken up by the weight of the structure. The maximum tensile strain of the iron is five tons per square inch.

The pivot bolt, which has a diameter of 4½ in., has to withstand a maximum pressure of 85½ tons; it is made of cast steel, and turns in a cast-steel socket; the casing into which the pivot bolt is fixed by means of screw threads is also made of cast steel. The adjustment is effected by turning the bolt from the top, and the wheel shown in Fig. 12 serves to fix the exact position. Three adjustable cast-steel guide blocks, fastened to the socket at the lower part of the casing, prevent the circular motion of the latter, and in order to enable the step bearing from underneath the pivot bolt to be removed when the bridge is firmly shut, the socket is made in several parts. These parts of the mechanism are placed, however, between the plated sides of the cross girders, and for this reason they are very difficult of access; to obviate this inconvenience, a simpler form of construction has been proposed, in which the position of the pivot bolt is fixed, whilst the step bearing above is adjustable from below by means of a cotter or wedge.

The mechanism at the movable supporting end of the bridge is shown in the annexed Figs. 13 and 14; it consists of three parts, namely, the lifting apparatus, the support, and the slitting and signalling apparatus. The superstructure of the bridge, when turned towards the

spring is prevented from acting before the roller receives that pressure.

In calculating the strength of the structures the load has been assumed as 40 cwt. per foot run; 7½ cwt. of piers, rests on the pivot pin and the rollers, and the lifting apparatus is used for raising the end of the bridge to a height of about 5 in. The power required for effecting this increases uniformly in proportion with the distance