when the bridge is in position for the passage of trains, and also for securing the perfect continuity of the line of rails, the following arrangement is adopted, shown in Figs. 13 to 16. Each extremity of the bridge is lifted slightly by a horizontal hydraulic press, N, Figs. 13 and 14, acting upon the levers, P P, which form a toggle joint; the press has two rams acting in opposite directions upon two toggle-joint levers, which are connected by a horizontal bar, Q, and this bar is confined to a vertical movement by a stud sliding in a vertical guide, so as to insure an exactly parallel action of the two toggle-joint levers, in order thereby to lift the bridge end exactly parallel. While the end of the bridge is thus held lifted, the three resting blocks, R R, one under each girder, are pushed home by means of three separate hydraulic cylinders, S S, Figs. 15 and 16; the bridge is then let down upon these resting blocks by the withdrawal of the toggle-joint levers, P P, and the bridge ends are then perfectly solid for trains to pass over. The hydraulic cylinders, N and S, for working this fixing gear at the two ends of the bridge, are controlled by valves placed upon the centre platform in reach of the bridgeman, the pipes from the valves to the cylinders passing along the side of the roadway of the bridge.

For the purpose of enabling the bridgeman to stop the turning movement of the bridge at the right place, an indicator is provided, consisting of a dial with two pointers, which are actuated by the motion of the bridge. One of these pointers makes two revolutions and the other 42 revolutions for one complete rotation of the bridge; they are similar to the hour and minute hands of a watch, the slower pointer being analogous to the hour hand and the quicker one to the minute hand. The bridge has no stop to its turning movement, and would swing clear past its right position if the turning power were continued; but the bridgeman being guided by the indicator, knows when to stop and reverse the hydraulic engines for the purpose of stopping the bridge at its right place. When this is done, a strong locking bolt, T, Figs. 12 to 15, 3 in. thick, pressed outwards by a spiral spring, is shot out at each end of the bridge into a corresponding slot in the fixed girder, so as to lock the bridge; and when the bridge is required to be opened these two bolts are withdrawn by a wire cord, U, Fig. 15, leading to the platform on which the bridgeman is stationed.

In consequence of the line of the bridge lying in a north and south direction, the heat of the sun acting alternately on the opposite sides of the bridge produces a slight lateral warping; and in order to bring the ends back into the straight line after swinging the bridge, so as to enable the two locking bolts to enter their slots, the feet of the toggle-joint lifting levers, P P, are bevelled off at 55° on their inner faces, as shown at I I, in Fig. 14, and bear against corresponding bevels, V V, on the bedplates. By this means the ends of the bridge when warped are forced back into the correct centre line, in which they are then held secure by the locking bolts.

As the accumulator is stationary in the centre pier, while the fixing gear at the ends of the bridge travels with the bridge in swinging, the communication of water power is effected by a central copper pipe, W, Fig. 8, passing up in the axis of the bridge through the middle of the centre girder, and having a swivel joint at the lower end. Also as the bridgeman's hand-gear rotates with the bridge while the hydraulic turning engines are stationary, the communication for working the valves is made by a central copper rod, X, Fig. 8, passing down through the centre of the pressure pipe, W, in the axis of the bridge. The hydraulic engines are reversed in either direction by the action of a small hydraulic cylinder, which is governed by the movement of a three-port valve actuated by the rod, X, from the bridgeman's platform.

The time required for opening or closing the bridge, including the locking of the ends, is only 50 seconds, the average speed of motion of the bridge ends being 4 ft. per second. For the purpose of insuring safety in the working of the railway line over the bridge, a system of self-acting signals is arranged, which is actuated by the fixing gear at the two ends of the bridge; and a signal of "all right" is shown by a single semaphore and lamp at each end of the fixed part of the bridge; but this cannot be shown until each one of the locking bolts and resting blocks is secure in its proper place.