Interlocking Plant at the Bascule Bridge over the Falsterbo Canal

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In conjunction with the construction of the Falsterbo Canal and the bridge over the canal for railway and highway traffic to Falsterbo there was arranged an interlocking plant. The plant was ordered by Mr. Rudolf Kolm, chief of the bridge building section of the Highways and Waterways Board, from Signalbolaget and was put into service in April 1941. The interlocking machine comprised in the plant is a relay interlocking machine (or press-button interlocking machine).

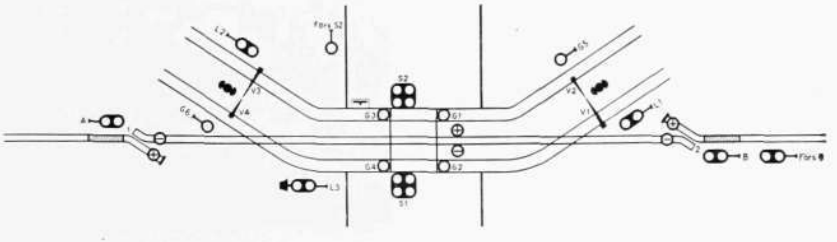
Owing to the difficult shipping conditions that arose through the blockade of shipping around Falsterbo Head, the Swedish Riksdag decided that a canal should be cut through the narrowest part of the Falsterbo isthmus to provide passage for shipping which would otherwise have to go round Falsterbo Head.

As this canal would cut across both highway and railway to Falsterbo a bridge had to be provided. The nature of the ground was such that a high-span bridge could not be arranged to advantage and it was necessary to have a bascule bridge. A readymade bridge was purchased, the wellknown Knippels Bridge of Copenhagen which had been replaced by a wider bridge necessitated by the needs of the traffic. As the bridge bought is not wide enough to allow the railway track to run alongside the highway it has been necessary to lay the track in the roadway. Railway and road traffic, therefore, must proceed alternately across the bridge. Obviously the railway and road traffic must be stopped to give passage to ships necessitating the raising of the bascules, Fig. 1.

Drop barriers and illuminated signals have been provided for barring the road traffic, see Fig. 2. The barriers are operated by electric winches, fixed directly on the frames. The illuminated signals *L* show white flashing light when the bridge is free for road traffic, otherwise red flashing light. In addition lowlying signals *G* have been placed close to the foot-walks immediately in front of the bascule, these showing red light when the bridge is raised.

To make the vehicles keep to the left half of the road in the bridge area, traffic dividers have been set up in the middle of roadway immediately outside the barriers.

For stopping the railway traffic illuminated home signals *A* and *B* have been arranged, these showing fixed red light when the bridge is given up to road traffic or the bridge bascules are locked in raised position, and fixed green light when the route is clear for railway traffic. Owing to the track making



X 5891

Fig. 1
Lay-out of the plant

Fig. 2 X 5803
Lifting gates, illuminated signals and traffic dividers
at the entrance to the bridge

a curve in front of signal B, so that signal is only seen at a comparatively short distance, the distant signal B has been arranged. Inside the signals A and B electrically operated safety points have been laid, which take up protective positions when the bascule is up. Outside the safety points, insulated track sections are arranged, used for track locking and for point locking. The track locking is cleared only when the train has passed the last insulated section in the direction of its passage. When the bridge is to be opened, in order that the bascule be locked, the safety points must take up protective positions, the home signals A and B show fixed red light, the barriers be down and the signals L show red flashing light.

Water traffic is regulated by two illuminated signals S_1 and S_2 (signal S_2 has a distant signal at the south canal entrance), constructed as position light signals with four points of light. These signals are set up at either side of the pillar that carries the bascule. By means of these signals »stop», »tie up at quay» and »free passage under the bridge» can be signalled. The signal indications consist of two uncoloured lights, together forming the signal aspect. »Stop» is two lights side by side in horizontal line. For signal indication »tie up at quay» one light lies 45° to the right above the other. In the signal indication »free passage» the lights lie one above the other. All these indica-

Fig. 3 X 5814
Control tower of the bascule bridge

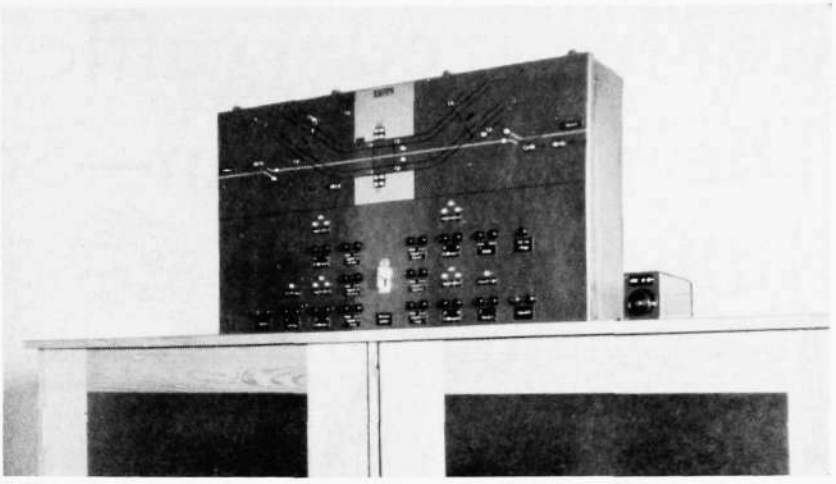


Fig. 4 X 5804
Interlocking machine
with press-buttons and illuminated diagram

tions are either flashing or fixed. The flashing signal indication is preliminary to the fixed indication which is the execute signal.

The signal indication »free passage» can, when the bridge bascule is raised, only be given by one signal at a time. »Stop» and »tie up» can be given no matter what indication the opposite signal may give or what position the bascule may be in.

For the operation of the above-described devices an interlocking machine is fitted in the bridge control tower, provided with press buttons, see Fig. 4. The buttons actuate relays, which in turn operate points, signals, lifting gates and locking motors. Relays are likewise used for indication and interlocking. On the upper part of interlocking machine there is arranged an illuminated track diagram, showing in miniature the canal, the highway and the railway line, as well as points, barriers and signals. All the signal indications together with the positions of points, locks and barriers are indicated by lamps.

For the interlocking plant three-phase alternating current is taken from the power network which feeds the bridge machinery and this current is transformed or rectified for the different apparatus. A three-phase generator driven by an internal combustion engine is installed as reserve power feed. If the power feed fails, the bascule bridge must be operated by a reserve internal combustion engine which is coupled to the bridge pinion gear by a claw clutch. This clutch is locked by a control lock in such a way that the key, normally under lock on the interlocking machine, sets all signals at »stop» when it is removed from the interlocking machine. In addition the clutch lever of the engine is locked in disconnected position by a magnetic lock, which cannot be unlocked until all electric interlockings have been set for the raising of the bascule.