

made by Boller, Hodge and Baird, consulting engineers, New York, and is designed under the specifications of the Railways and Canals Department, for class 1 loading, and consists of one 368 ft. c.c. through draw span, with one 60 ft. and two 70 ft. over all deck plate girder approach spans, all single track, with one walkway. The approach spans are 6 ft. 6½ ins. and 7 ft. 6½ ins. deep out to out of flange Ls., which in all cases are 6 ft. 6 ins. with 14 in. cover plates. The girders are spaced 8 ft. c. to c. and are thoroughly braced with top and bottom lateral bracing and stiff end and intermediate cross frames. Transverse 10 in. I beams are riveted to the top flanges to form supports for the walkway.

The draw span is 368 ft. long, c. to c. of end bearings, with trusses spaced 18 ft. 3 ins. c. to c., the length being divided up into 12 panels of 30 ft. 2 ins. each with a central panel of 6 ft. over the pivot pier. The depth of truss varies from 30 ft. at the end to 57 ft. c. to c. of chords at the centre over the pivot pier. All members are designed to resist both tension and compression except members L4-U5, U5-U6, U6-U6, which sustain tension only and are made of eyebars. The end posts, top chords and main diagonal posts at the pivot pier are built of 21 in. web plates, 24 in. covers, 3½ by 3½ in. top Ls and 5 by 3½ in. bottom Ls. The lower chords from end to end are built of 20 in. web plates with 4-3½ by 3½ in. Ls and with 13 in. side plates where necessary. All intermediate diagonals, except where

eight trailing wheels running on a cast steel track 25 ft. in diameter. The main rack circle and the track are cast together in 13 sections. The two main centre girders are 105 ins. deep out to out of Ls, with 8 by 8 in. flange Ls and 18 in. cover plate and carry the dead load of the span to the pivot girders 6.5 ins. deep resting on a steel casting which bears directly on the discs. While closed the ends of the trusses are supported by cast steel wedges, which are driven by the operating machinery so as to bring a dead load reaction under each end of each truss of 60,000 lbs., thus preventing the end from rising from its support under certain conditions of loading. Each truss is supported at the pivot pier by two wedges spaced 6 ft. apart, but which are so adjusted that they take live load only, the dead load being carried by the pivot. Both the end and the centre wedges are operated by worm gears driven by shafting from the operator's house, and protected by cast iron casing, which is so arranged that the gearing runs in a path of oil. The main pinion for swinging the span is cast steel 15 ins. in diameter keyed to the 7 in. main turning shaft, and suitable gearing is provided between this shaft and the engine shaft to give the required speed.

The power for turning the draw and for operating the end and centre-wedges is supplied by a 25 h.p. Fairbanks Morse gasoline engine, located in the operator's house above the tracks at the centre of the draw, the main shaft having a velocity of 220

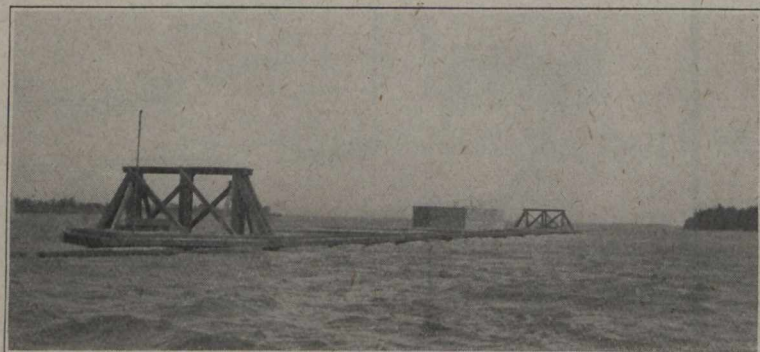
The Canadian Bridge Co. was awarded the contract for this job, and this part of the bridge is now being erected. Due to delays in delivery of material from the mill, the bridge company will not complete this erection until some time in October.

The work on Goat Island consists of a small yard, including a 4 stall rectangular house, of frame construction, on concrete foundations, with concrete pits, a concrete cinder pit, a 100 ton Fairbanks-Morse elevator coal chute, and a water station consisting of a 50,000 gall. tub on a 30 ft. tower, with a windmill extension for pumping, together with an auxiliary 5 h.p. gasoline pumper. Water is pumped into this tank and from thence discharged to a 10 in. Sheffield Johnson telescopic standpipe, and to the locomotive house and coal chute for service use and fire protection.

The docks consist of a coal dock and a commercial dock. The coal dock has 450 ft. frontage in the channel. It consists of timber cribs built up to an elevation of 5 ft. above water. They are of round hemlock to 2 ft. below low water, and of square 12 by 12 in. B. C. fir above this elevation. They are framed in 100 ft. sections and sunk with rock. Afterwards they are filled to top with stone. These cribs are at present in 6 to 8 ft. of water. Arrangements are completed for dredging in front of the dock by the Dominion Government. After sinking these cribs, forming the face of the proposed dock area, filling will be deposited back of same to bring the area just above



Nose of Protection Pier ready to sink.



Pivot and Protection Pier.

eyebars are used, are built of 18 or 20 in. web plates, with 4 Ls 3½ by 3½ in.; the verticals are built of a plate and 4-6 by 3½ in. Ls where they act as hangers and of 2-15 in. Ls where they act as post.

The floor system consists of stringers 53 ins. deep, riveted into the floor beams 66 ins. deep, which are in turn riveted into the verticals of the trusses. Top and bottom bracing is of Ls, designed for tension only in the case of the top laterals, and for both tension and compression in the case of the bottom laterals. Each portal consists of 4-7 by 3½ in. Ls latticed with 3½ by 3½ in. Ls, forming a frame 3 ft. 9½ ins. deep with two plate braces. Transverse bracing at intermediate points consists of 4 Ls 5 by 3½ ins. laced with 3½ by 3½ in. Ls, forming frames of varying depth according to the height of the trusses. The transverse bracing at the centre posts is arranged to allow room for the operator's house, and consists of frames similar to the intermediate transverse bracing, above the house, and in addition heavy kneebraces connecting to the 24 in. box girder supporting the house. The centre posts are braced longitudinally by 3½ by 3½ in. Ls, which stay the two adjacent posts against longitudinal flexure and at the same time allow the truss to adjust itself during erection to two bearing points over the pivot pier.

The span while swinging turns on a pivot provided with steel and phosphor bronze discs 25 ins. in diameter, and is steadied by

r.p.m. and working the machinery through two friction clutches. The turning shaft and the wedge driving shaft are each provided with a jaw clutch, so that the power can be transmitted to each one as desired by moving the necessary lever. A safety device is provided for the wedge shaft, to prevent driving the wedges too far and injuring the latching machinery, consisting of a cross head connected by levers to the jaw clutch of the wedge shaft and so adjusted that when the wedges have been drawn far enough it will have moved sufficiently to disengage the jaw clutch and thus shut off the power from this shaft. The ends of the spans when closed are held in position by a latch located at the centre of the end floor beams and which is so connected with the wedge shafting that it is lifted from its socket when the wedges are withdrawn. When the span swings, the latch strikes a projection on the socket casting and is lifted, thereby disengaging a trip, which allows it to drop to its original position, so that when the span is closing the latch rollers will mount the inclined sides of the latch casting on the pier and drop into the socket, thus firmly latching the span before the wedges are driven home. All lengths of truss members are corrected to bring the lower chords in a horizontal line with the bridge closed, and the wedges driven to give a 60,000 lb. reaction at end of truss. The computed drop in end of truss when wedges are withdrawn is 1.4 ins.

water level, forming a storage ground for coal. This storage space is planned to hold 80,000 to 90,000 tons of coal. Later extensions can be made to increase this.

A modern unloading and reclaiming coal handling plant is arranged for in connection with this dock, to be furnished and erected by the Brown Hoisting Machinery Co., of Cleveland, Ohio, and consists of an unloading and reclaiming bridge, of 300 ft. span, covering over the storage space, with a cantilever overhang at the front of 83 ft. One end of this bridge will be carried on a portal pier arranged to run on two tracks spaced 32 ft. centre to centre. Each track will consist of two lines of 100 lb. rail, spaced 2 ft. 4 in. centres, and the other end will be carried on a shear leg, arranged to run on a similar single track.

The front track of the portal pier will be laid on two lines of B. C. fir, 24 by 24 ins. in size, laid directly on the dock cribs, the other portal track will be also laid on two lines of 24 by 24 ins. timbers supported by short 12 by 12 in. cross ties laid on rock filling. These two pairs of rails will be tied together by long cross ties 12 ins. by 12 ins. by 40 ft. spaced 10 ft. apart along the dock front. The shear leg track will be laid on 24 by 24 in. timbers, supported by concrete pedestal piers spaced 10 ft. centre to centre.

The bridge will be of sufficient capacity to unload coal out of a boat at the rate of 200 tons an hour, including the cleaning up. The bucket will be of 124 cu. ft. capacity, and