

When the lock is closed all signal lights show up white, indicating that the bridge is safe for traffic. During the times when the bridge is closed and the locks in place, the lock motor circuit breaker is closed so that the auxiliary switch disconnects the alarm bell and low voltage release coil of the oil switch from the 110 volt busses. A set of emergency knife switches is provided on the switchboard panel, which, when closed, cuts out the main motor and lock motor contactors, respectively. These switches are normally sealed in the open position and would only be made use of in case of damage to any of the contactors, or some other emergency condition requiring operation of the bridge independently of the interlocking system.

The bridge signals described above are interlocked with the railway's interlocking system, in such a way that a train would be derailed if it attempted to cross while the bridge was in the open position.

The bridge was erected in the open position by means of a stiff leg derrick mounted on top of a wooden erection tower 125 ft. high. The pouring of the concrete for the counterweight was carried on simultaneously with the erection of the steel, so as to balance the structure at all times during erection.

is composed of concrete extending across the bridge from truss to truss. It adds to the rigidity of the entire structure, as it is rigidly attached to the trusses. The segment upon which the bridge rolls, the counterweight and the truss spanning the channel are rigidly riveted together, forming a

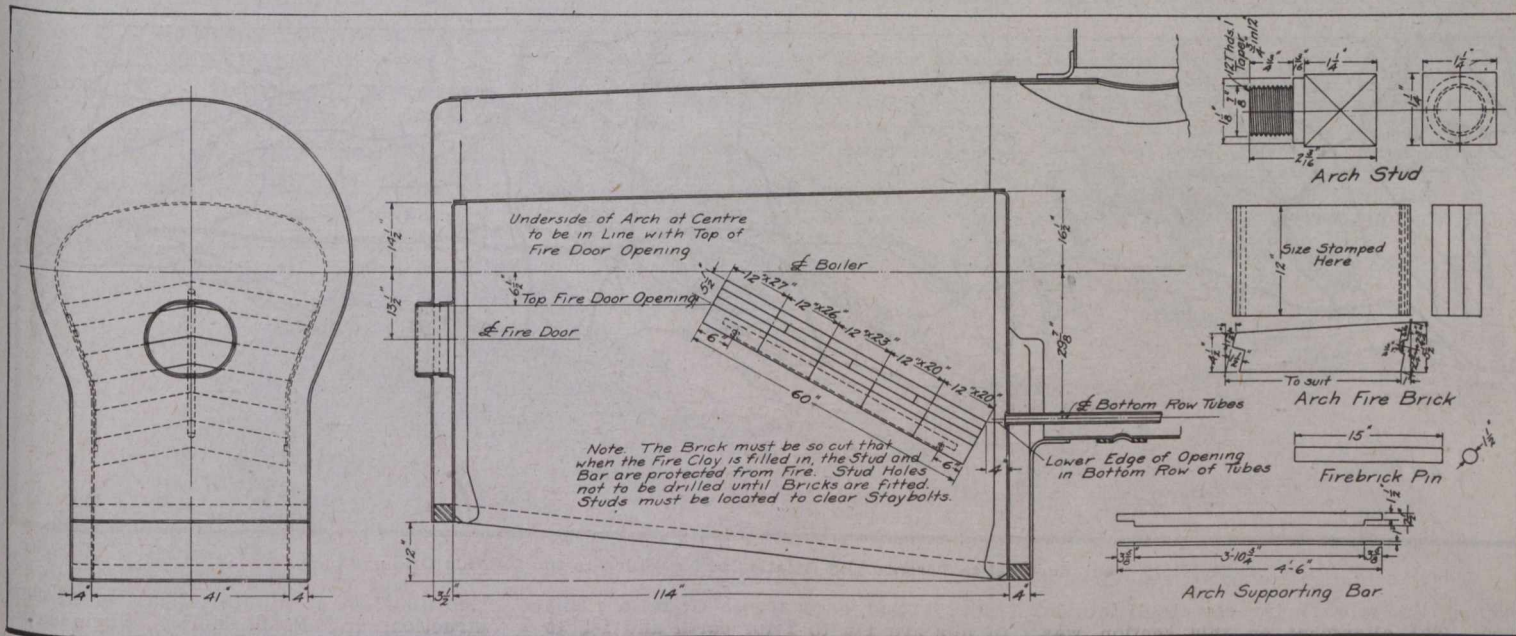
one piece structure. The bridge operates on the principle of a wheel resting upon a track, except that only a quarter of the wheel or segment is required, because the bridge moves only a comparatively short distance. This makes it unnecessary to have a journal or axle."

Brick Arch for Canadian Northern Railway Locomotives.

The accompanying illustration shows a brick arch arrangement used on the C.N.R. eastern lines for locomotives having narrow fireboxes set on top of the locomotive frames. It contains many points of excellence over the more elaborate arch types, and is used on fireboxes having widths up to 66 ins. The most apparent changes between this type and the more usual design, lie in the elimination of the arch bars, the bricks being of such size and shape as to form the arch in themselves. Each arch consists of 10 bricks, in a row of 5 on each side, slightly arching towards the centre on each side of the firebox. There are two arch studs, fitted to clear the staybolts, on which rest two arch supporting bars, the outer ends of the brick being so formed as to fit on the narrow shelf thus provided.

crevices, the stud and bar are protected from direct contact with the fire. From its construction, it is a very simple matter to apply the arch, and, if required, to remove it, leaving the firebox in its former condition. To date 16 sizes of brick have been used, on two classes of locomotives.

The C.P.R. "better farming" special trains, operated in connection with the Manitoba Government, which went on duty recently, contain specimens of noxious weeds most troublesome in the province, and lectures are given to teach the effectual methods of eradication. There are models of weed seeds, so that identification is easy; Manitoba birds, with instructions as to their habits, whether destructive or beneficial; injurious insects are illustrated



Brick Arch for Canadian Northern Ry. Locomotives, Showing Details of Construction.

The current for operating the bridge is obtained from the Kaministiquia Power Co. and is 2,200 volts, 3 phase, 60 cycle a.c., stepped down to 550 volts for use on the bridge.

The electrical control apparatus described is housed in an operator's house on one side of the bridge. The bridge is also equipped with a hand operating mechanism for use in case of an emergency.

The total weight of the steel work and machinery is approximately 660 tons. The bridge was designed by the Scherzer Rolling Lift Bridge Co. of Chicago, under the direction of P. B. Motley, M. Can. Soc. C.E., Engineer of Bridges, C.P.R. It was fabricated by the Bridge Department of Canadian Allis-Chalmers, Ltd., in its Toronto works and all calculations in regard to counterweight, etc., were worked out in its engineering department after the shop drawings were made. The entire electrical equipment was furnished and installed by the Canadian General Electric Co.

The designers of the bridge, in some information sent Canadian Railway and Marine World, say:—"The counterweight

The inner end of each brick is channeled to receive the half of a 1½ in. firebox pin, securely locking the arch together by its own weight. The bricks have a width of 12 ins., forming an arch 60 ins. deep. The locking pins are 15 ins. long, locking each pair of pins to its adjoining mates. Another type of central mating joint is employed in special cases, of the tongued and grooved type, dispensing with the locking pins. This tongue and groove are of the same dimensions as the locking pin.

The good points claimed by the railway officials for this type of arch are that flat bricks are used, which are easily made, have a low initial cost, pile readily and are easily packed in cars without damage in transit. The same bricks are used on all locomotives, apart from the length, which varies. The arch is supported on each side by a bar, and two studs instead of four, reducing the risk of leaking to a minimum. It is 15% lighter in weight than the usual arched type, and it is easily applied and maintained.

In applying, the bricks are so cut that when the fireclay is filled in the side

on the moving films; a car with cattle, sheep and pigs in connection with which lectures will be given to young men, especially; a car devoted to home economics for women, where lady demonstrators teach nursing, sewing, and so forth. Field crops and miniature lay-outs of farm buildings are shown in two cars, while instruction is given as to the protection of such buildings. In Saskatchewan two large cars are devoted to stock, and instruction will be given in everything practically appertaining to farm life.

The Pennsylvania Rd. has issued an order prohibiting train employes from manipulating the lower hand brakes on freight cars by means of brake clubs, investigation having proved that the careless use of clubs on the lower brakes, or "tunnel" brakes as they are called in railway parlance, resulted in one employe being killed.

The C.P.R. pension fund now has at its credit nearly \$750,000, and there are 605 pensioners. Last year the payments to pensioners were \$169,329, and during the year the C.P.R. contributed \$125,000 to the fund.