stress actually reached, that it is doubtful if the hoops contributed anything to the strength of the columns. In other words, the presence of the longitudinal seems to be capable of accounting for the stresses actually obtained.

Two compressometer tests were made on plain concrete columns of the same sectional area, the span between collars being 15 inches. The stress-strain curves are shown in figures No. 1 and No. 2. For the purpose of comparison, a modulus of elasticity for each was determined for stresses of 500 pounds per square inch, and also at a strain of .0014 as was done for the concrete of the reinforced columns. The results are given in the table following:—

Plain Concrete.

No.	Ec at stress 500.	Ec at strain .0014.	Ult. strength.
1	2,630,000	1,060,000	1,542
2	2,200,000	1,100,000	1,744

Apparently the earlier modulus is somewhat larger than in the cases where the columns were reinforced. The later modulus, however, remains practically the same, showing that the hooping in this instance has contributed nothing to the stiffness or rigidity of the concrete which it encloses. We must not lose sight of the fact that the explanation of these phenomena is probably due to the wide spacing of the rings of metal. These tests as might be expected, lead to no conclusions as to the comparative merits of spirals over hoops or vice-versa.

Conclusions.

1. The employment of longitudinal steel reinforcement in concrete columns is not economical except where high working stresses in the concrete accompany a low value of Ec.

2. The hoops and spirals in the cases examined contributed little or nothing to the strength of the column beyond what could be explained by the presence of the longitudinal rods.

3. The hoops and spirals did not increase the rigidity of the concrete which they enclosed. These two phenomena may be explained by the fact that the pitch of the hoops was much greater than is considered good practice.

4. For columns up to 25 diameters, the tendency to fail by buckling under centrally applied loads is probably small.

5. For this particular class of concrete a modulus of elasticity of 1,500,000 for a stress of 500 pounds per square inch seems to be a fair value.

6. The variation in the ultimate strength values of the separate columns would indicate the necessity of employing a fairly high factor of safety in the use of reinforced concrete columns for construction purposes.

The total production of pig iron in Canada in 1907, from both Canadian and imported ores, according to direct returns from nine companies operating sixteen furnaces, was 651,962 short tons valued at $9,125,226, an increase of nearly 9 per cent. in quantity over the amount made in 1906. These figures do not include ferro-products made in electric furnaces. Of the total output of pig iron last year 10,047 tons were made with charcoal as fuel, and 641,915 tons with coke.

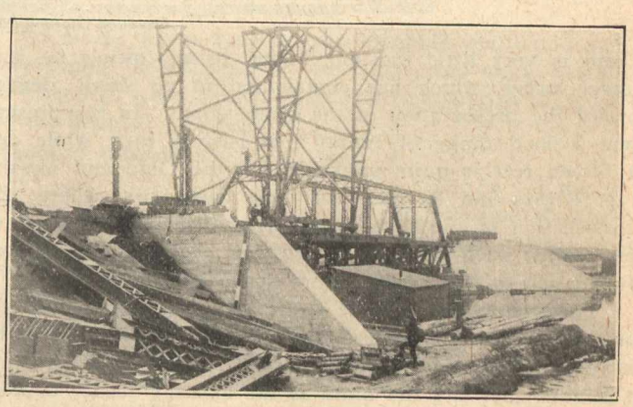
The business in railway rolling stock in Britain is especially heavy just now, one Birmingham firm, for instance, having in hand the supply of 2,000 steel cars, complete with wheels and axles, while another at Glasgow has been successful, in face of severe competition, in securing an order for seventy-one engines for the Indian State Railways, and a third has booked a South American contract for fifty-five locomotives.

Owing to the dust nuisance arising from the increasing traffic of motor-cars, the Kent County Council, (England), recently intimated to the urban authorities that they are willing to pay one-half of the cost of tar painting the main roads, providing the amount does not exceed 1½ cents per cubic yard. The authorities consider the offer altogether inadequate.

MOVABLE DAMS FOR THE BARGE CANAL.

By James Cooke Mills.

The earlier canal-builders of the State of New York encountered many difficulties in the use of fixed dams where the flow was widely fluctuating; consequently the modern device of movable dams has been adopted for the Erie Barge Canal wherever their advantages render this course desirable. Movable dams have come into quite general use in Europe, and more recently the United States Corps of Engineers have employed them on some of the rivers canalized in the South and Central West. A number of these movable dams of various types, in this country and abroad, have been examined by eminent engineers of the barge canal, and after thorough consideration of the subject, and with the approval of the Advisory Board of Consulting Engineers, the State engineers have decided to use the bridge type of dam on the lower Mohawk River.



Bridge and Dam Near Little Falls.

The bridge type of movable dam as applied on the Moldau River, in Bohemia, with success, has been adopted on portions of the River Seine, in France. These dams are of great utility in permitting the control of water surfaces to a degree impossible with dams having a fixed crest, and higher levels can be maintained except during floods. The use of a movable dam results in the river being restored to its natural condition during the season when the canal is not in use, and in time of flood the debris and silt is carried down stream instead of forming jams above the dam. The engineers have determined that these movable dams of the bridge type will be much cheaper in construction than fixed dams, and to show the particular type decided on for the barge canal they have made sketches showing the cross-sections, the dam in position, and the dam raised. It is believed that by their use a large amount of money will be saved in maintenance of the completed canal in dredging and in reduced flood damages, which the canalization of the river would cause in the Mohawk Valley.

Along the valley of the Mohawk River, which is traversed by the New York Central and West Shore Railways, there are many towns and villages lying at the foot of the hills in such locations that any considerable change in the natural conditions of the stream would endanger valuable property. Should flood levels be raised, as would inevitably occur with fixed dams, much loss would ensue, leading to claims for damages. Such complications with property, which movable dams would largely or entirely avoid, together with the initial cost, were considered by the Advisory Board of sufficient moment for the adoption of this type.

The basin of the Mohawk River and tributaries is of about 3,500 square miles, which, at extreme high-water periods, discharges at the mouth of the stream a volume exceeding 100,000 cubic feet per second. Between Schenectady and Little Falls, a distance of fifty-eight miles, the low-water fall is about 111 feet, or 1.9 feet per mile. The greater portion of the drop, however, is below Schoharie Creek.

From a geological point of view the Mohawk Valley is of unusual interest. The river itself is one of the oldest on