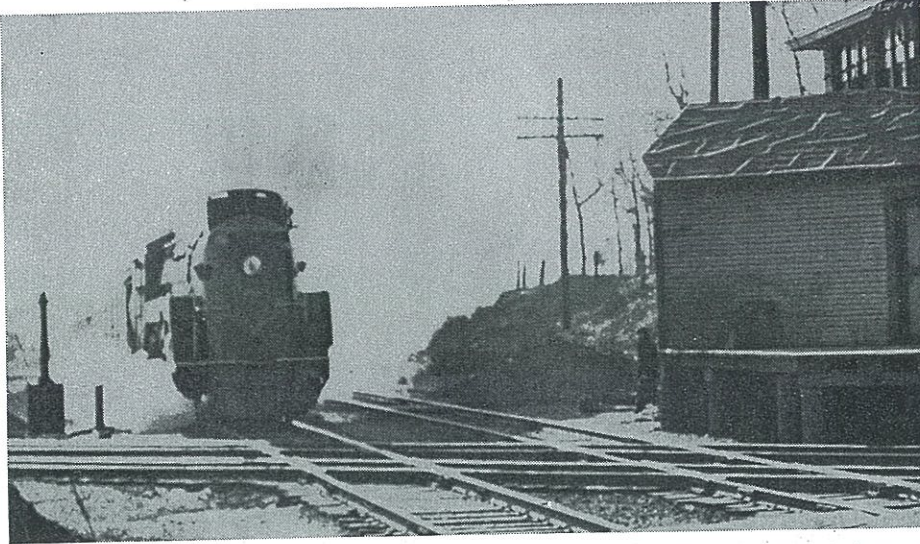


GRAND TRUNK
WESTERN
RAILWAY
DIARY



C. H. RIFF



"No. 15" at Griffith, Indiana.—Photograph by: A. Z. Bradford, Chief Operator, Telegraph Dept., Chicago, Ill.

Across the Border

Terminal Education

A total of 754 students and cub scouts and 71 adult escorts visited the Canadian National Railways terminal facilities at Detroit, Michigan and Windsor, Ontario recently. These special parties, coming from schools in and around Detroit, have had the co-operation of J. A. Clancey, General Manager of the Grand Trunk Western Railroad, who made it possible for the youngsters to look behind the scenes in a busy railroad terminal.

Coach Foreman Cornwall of the Brush Street terminal at Detroit, reports the following parties:

Twenty-seven students and five adults from the Harding School at Ferndale.
Sixty-nine children and four adult instructors from the Roosevelt School at Ferndale.

One hundred and eighteen high school students and three adult instructors from the Visitation School, Detroit.

Sixty-eight cub scouts and twenty-four escorts from Cerzenay School, Detroit.

Sixty-three students and five instructors from the Science Class of the Northwood School, Detroit.

Forty second-grade students.

Seventy-eight third-grade students.

Eighty third-grade students.

Seventy-two pupils and ten adults from Hubert School, Highland Park.

Sixty-five pupils and seven instructors from Starr School, Oakland County.

Seventy-four pupils and thirteen adults from Swartz Creek School.

Gave Safety Talk

Carroll Rush of the Grand Trunk Western Railroad police department, Battle Creek, Michigan, gave a safety talk recently before the student body of the High School upper grades at Vicksburg, Michigan. He laid particular stress on the danger of children playing on the tracks and properties of the company, where injury and potential fatality hazard is ever present.

School Outing

A Grand Trunk Western Railroad train recently took five hundred rural school children from Shiawassee County on their second annual trip to Detroit.

The train was in charge of Conductor J. D. Rogers, Durand, and officials making the trip included S. I. Rooks, Detroit; Ray Stevenson, Durand, trainmaster, and Benjamin Ball, Durand, captain of the Grand Trunk police force.

Others who accompanied the children were their teachers and Mrs. Margaret Smith, Shiawassee school commissioner, and Mr. and Mrs. Carlton Clark, Durand. Mrs. Clark is a teacher and Mr. Clark is ticket agent for the Grand Trunk. Mrs. Clark assisted in the arrangements of the outing.

Twin Cities Notes

Members of the Grand Trunk-Canadian National Railways family of the Twin Cities (St. Paul and Minneapolis) gathered recently to honor P. M. Fye who was appointed Travelling Freight Agent, Kansas City, Mo., succeeding Gordon M. Newby, who has become Freight Traffic Representative at Chicago. Mr. Fye came to Minneapolis in June, 1926 as Chief Clerk to General

Agent, Freight Department and in April 1935 was appointed Freight Traffic Representative at St. Paul, which position he held until May, 1940.

Mr. Fye was presented with a set of matched iron golf clubs by his friends of the Twin Cities, John Landis, Manager, Land Settlement and Development, C.N.R., St. Paul, making the presentation. A. J. Burns, General Agent of the New York Despatch Line, St. Paul, expressed on behalf of the Grand Trunk Canadian National staffs, the high regard for Mr. Fye as a co-worker and outstanding figure in transportation circles.

J. L. Cooper from Tulsa, Okla., who succeeded Mr. Fye as Freight Traffic Representative at St. Paul, was present and received a warm welcome.

Memorial Service Held

Approximately 125 persons attended the memorial service for departed members by the Grand Trunk Western Railway Veterans' Association and the Canadian National Railway Veterans' Association, held recently at Durand, Michigan.

Thomas J. Mulvey, of Pontiac, President of the G.T. Veterans' Association, presided and introduced the guest speakers, Trainmaster R. C. Stevenson, Rev. Percy Isherwood of the Episcopal Church and Rev. V. H. Coe of the Baptist Church.

Mr. Stevenson read the list of those being honored in the service and paid tribute to them. Rev. Mr. Coe related his experiences when he worked on the railroad. Rev. Mr. Isherwood paid tribute to those being honored and suggested to the veterans that they have an avocation now that they were retired from their vocation.

Veterans were present from Toronto, Sarnia, Hamilton, London, Battle Creek, Saginaw, Detroit, Port Huron, Grand Rapids and Owosso.

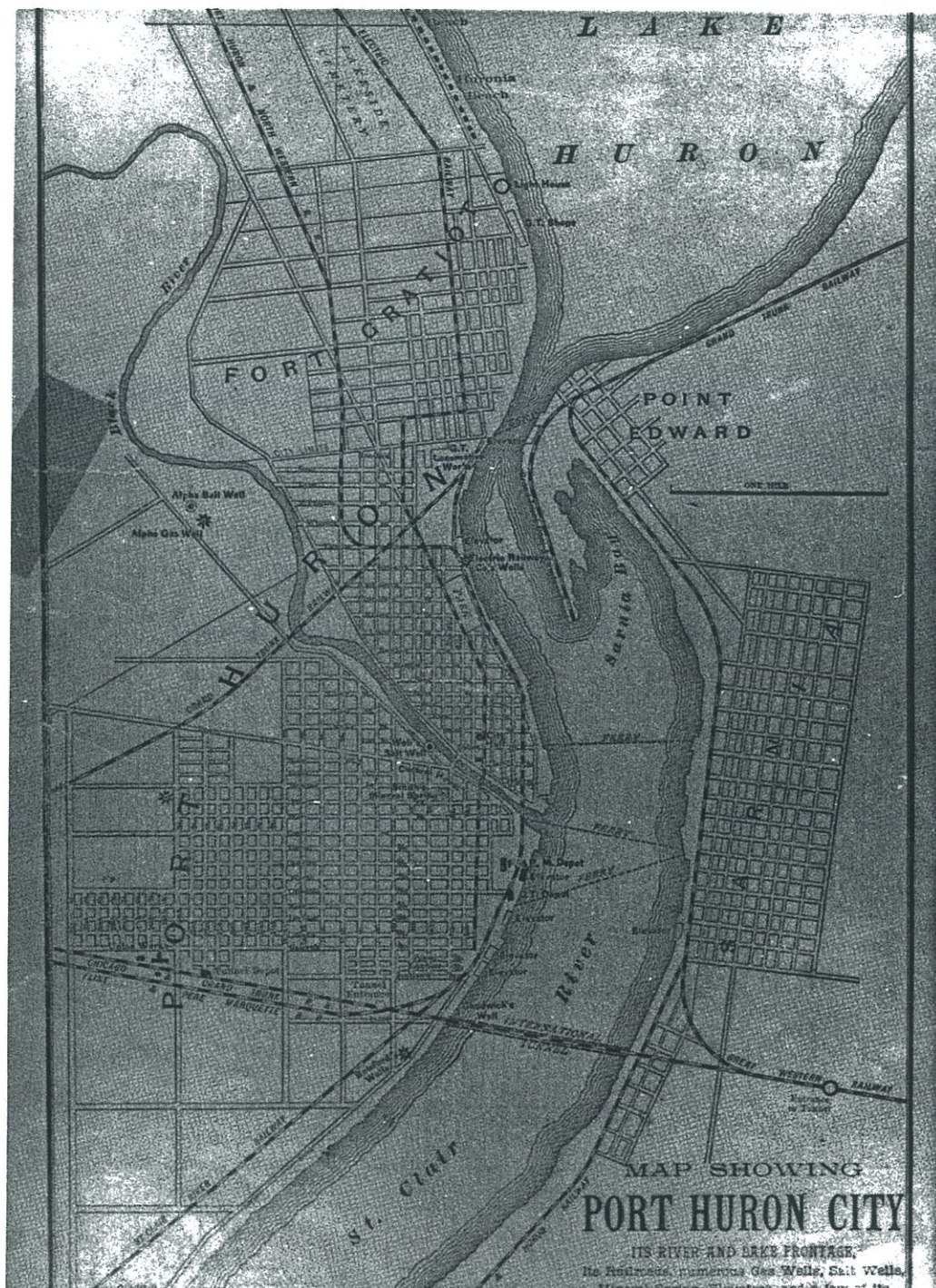
Deceased members honored at the service were: T. H. Johnson, Wm. Johnson, J. E. Detwiler, O. B. Britton, T. Smart, Wm. Riley, J. H. Smith, W. Collins, John Lossing and O. P. Robinson.

Kiwanis Speaker

A. A. Gardiner, Assistant General Traffic Manager of the National System, was a recent guest speaker before the Main Line Kiwanis Club at Haverford, Pa., on the occasion of Kiwanis United States and Canada Good Will Week. On his return to Montreal, Mr. Gardiner was asked to repeat the address to the Montreal Kiwanis Club. Mr. Gardiner's talk was greatly enjoyed by Montreal Kiwanians and evoked favorable editorial comment in the Montreal newspapers.

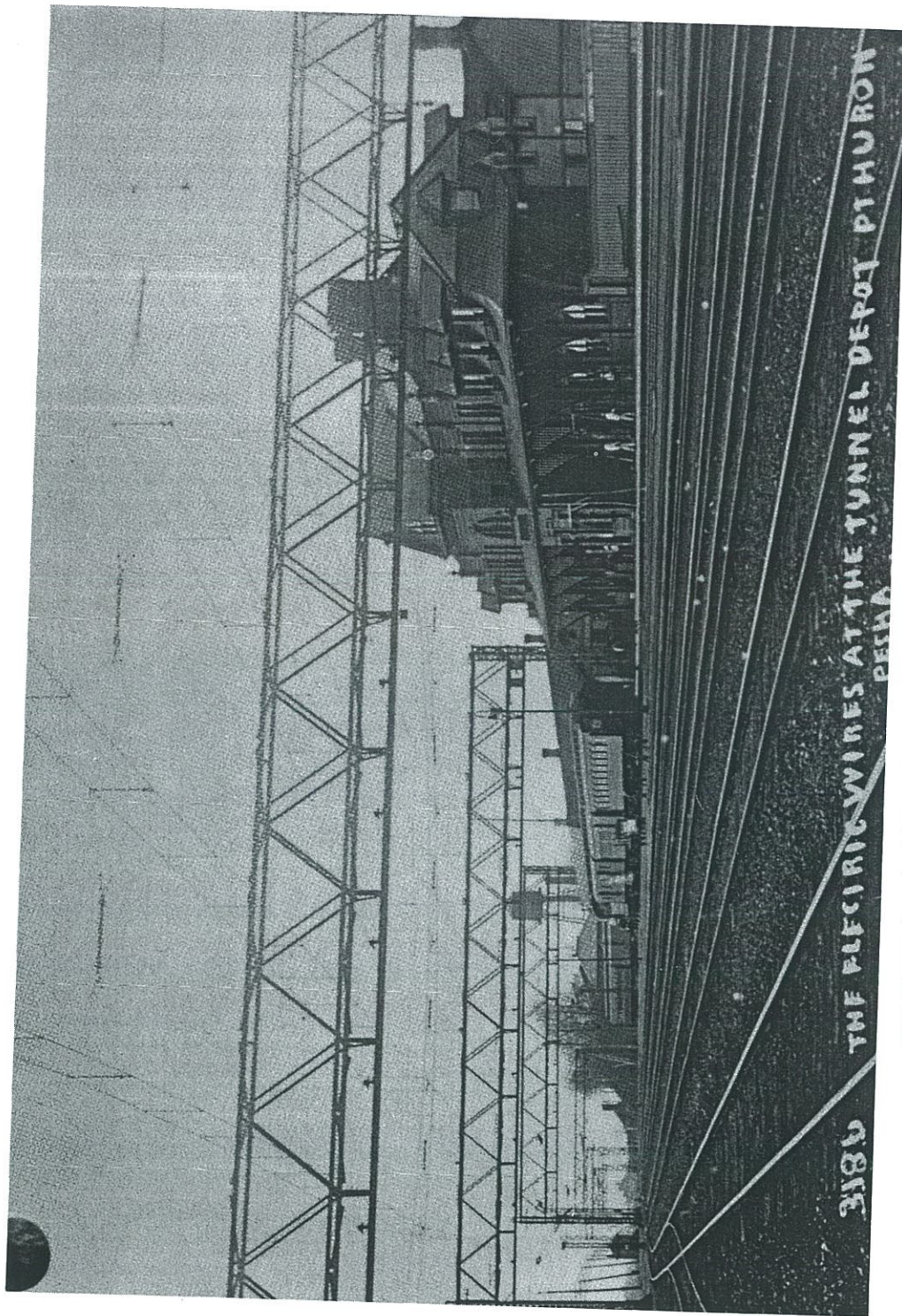


Switch-engine 3755 at Blue Island, Illinois, slowing down to pick up orders. Photograph by: A. Z. Bradford, Chief Operator, Telegraph Dept., Chicago, Ill.



Map of Port Huron-Sarnia from the back cover of the Port Huron Times special "Tunnel Opening" edition, September 19, 1891.

- St. Clair County Library



Port Huron depot looking west, circa 1910.

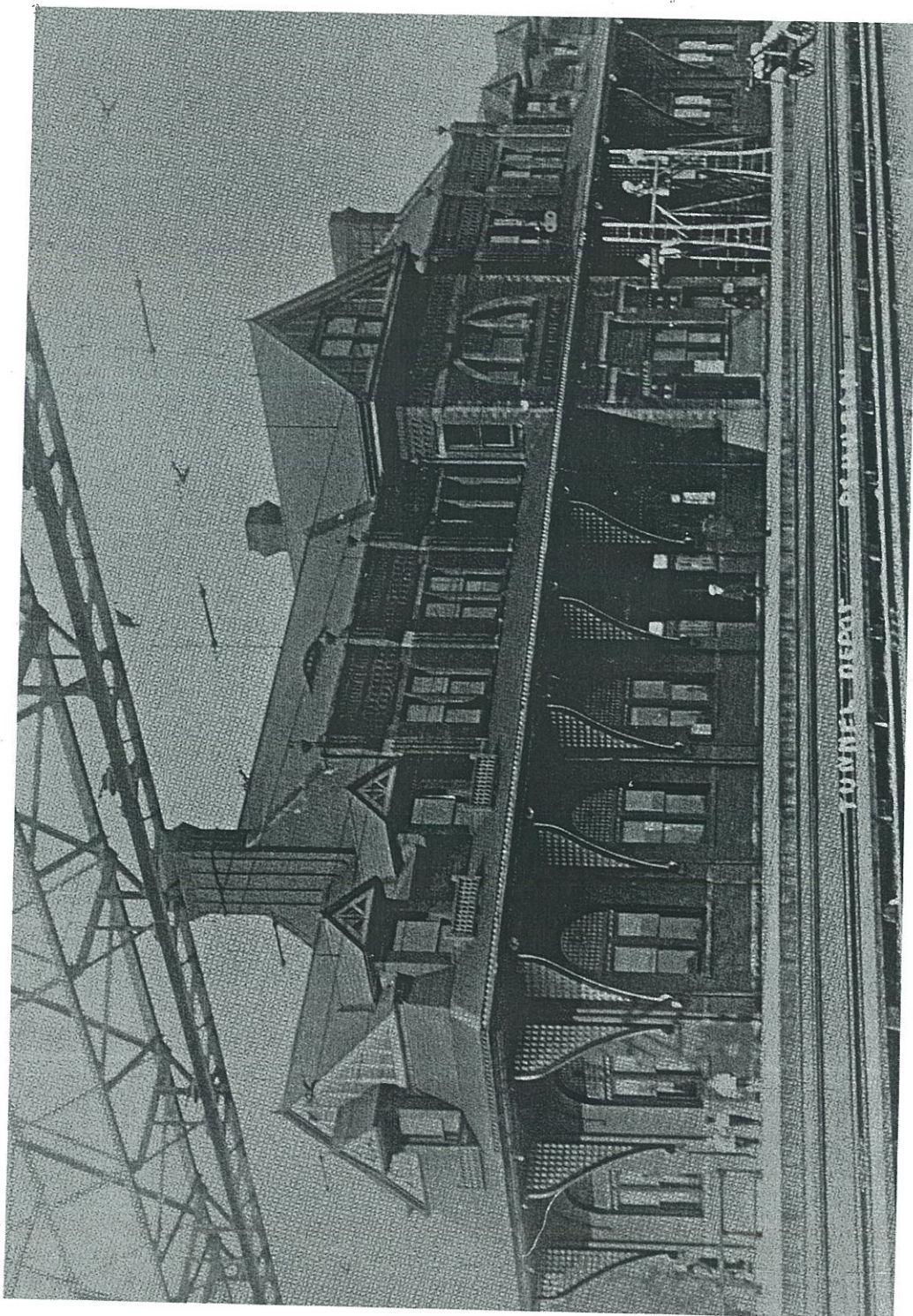
- Pesha photo, George Smith Collection

for transshipment
Great Lakes. The t
hours off the time
and saved the Gra
ating costs of the f
with regard to the
across the river on

The tunnel, how
lems. This appear
by the large steam
through the tunne
signed to burn cok
reduce the amou
quired 45 minutes
the gases complet
was considered sa
minutes.

On Sunday, Jan
months after reve
serious accident o
freight train brok
near proceeded o
attached to the er
thorne of London
of Point Edward c
but they were soc
were found, but e
failed, and he thu
phyxiation in the

A report in the
noted that the rai
ting men to work
brakemen were e
stantial wage at t
fumes was obvioi



Port Huron depot was completed in February 1892. It twice suffered fire damage to its interior, in 1893 and 1908, but was repaired both times. It was finally demolished in 1975.

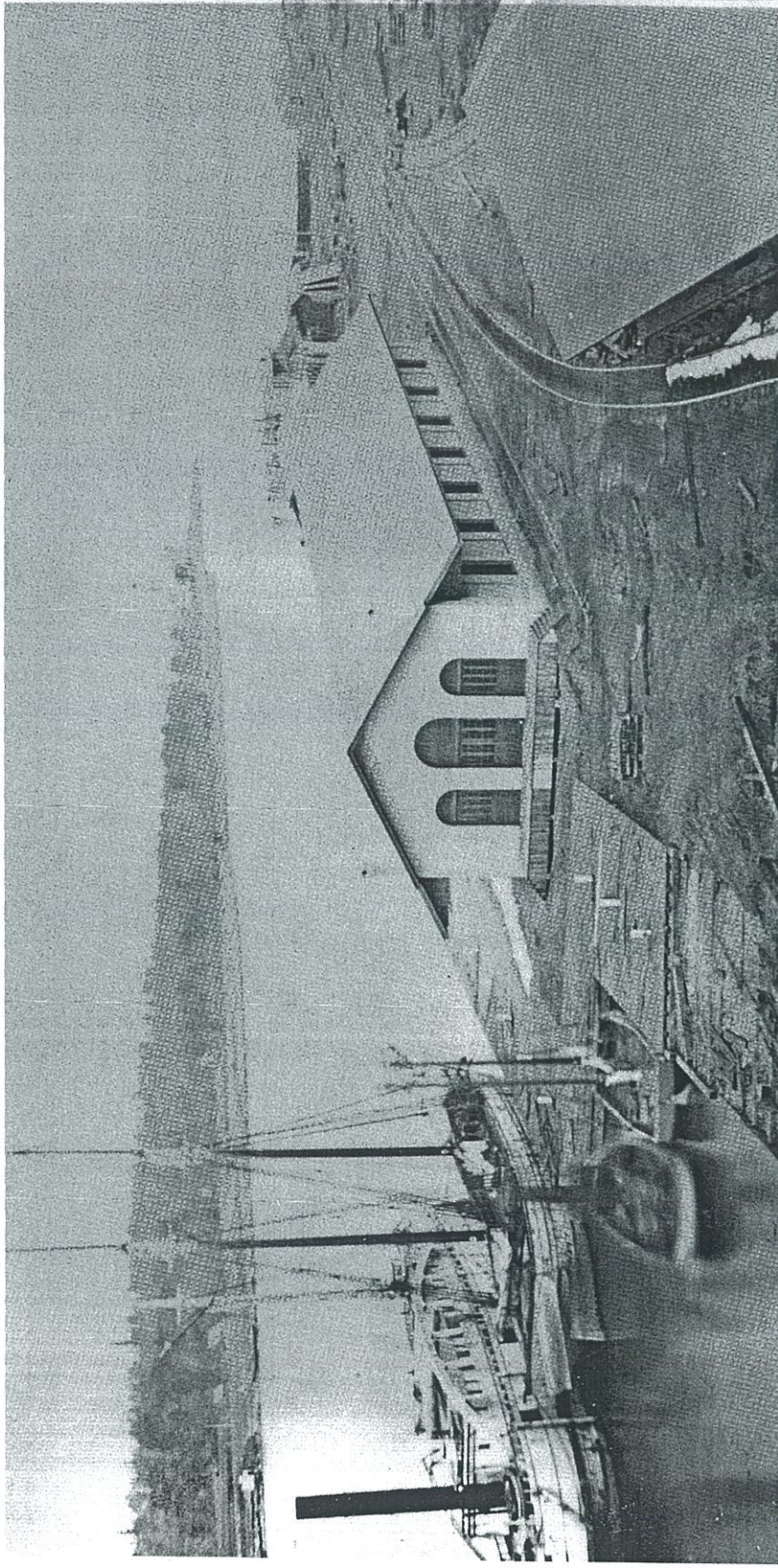
— St. Clair County Library

CHAPTER ONE:

The Railways At

In the late 1850s Samuel
railroad activity. The Cana
ada built a branch of li
line from London in J
front depot at the foot
lowing year, 1859, the
Canada completed its
way of Montreal and
Grand Trunk chose a
now the village of Poi
ways were built to the
inches. In November
tended their line from
site Point Edward, to
standard-gauge Chica
Trunk Junction Railw
with lines to Chicago

Docks were built at
Gratiot, and the Grand
system of transfe
steamer *W.J. Spicer* at
ment was time-con
intensive. Freight ha
to a boat, and then r
the opposite shore. V
nals were located at
Clair River, it was al
current of about 8 ki
Shipping was conce
Grand Trunk ferries
Also, during the win
drift down from Lak



*The original Grand Trunk Station at Point Edward, constructed in the late 1850s. It
burned down in 1871 and was replaced by a second, larger station.*

— NAC

CHAPTER ONE:

The Railways Arrive

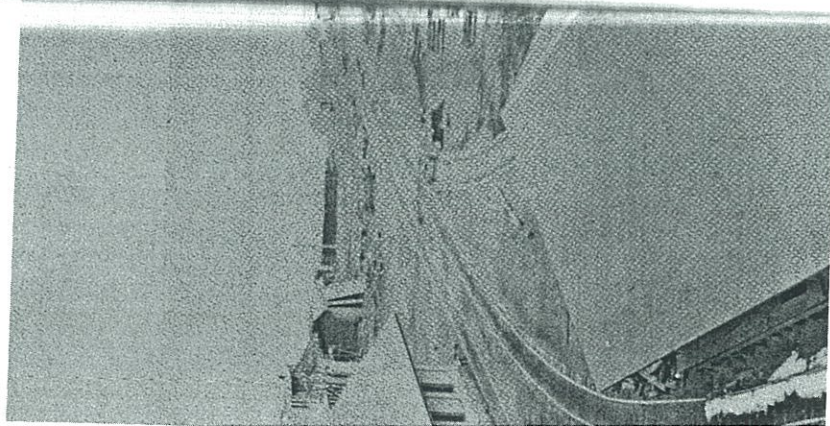
In the late 1850s Samia, Ontario, was a beehive of railroad activity. The Great Western Railway of Canada built a branch of its Niagara Falls-Windsor main line from London in 1858 and constructed a waterfront depot at the foot of Cromwell Street. The following year, 1859, the Grand Trunk Railway of Canada completed its line from Portland, Maine, by way of Montreal and Toronto. For their terminal, the Grand Trunk chose a site north of Samia at what is now the village of Point Edward. Both of these railways were built to the provincial gauge of 5 feet 6 inches. In November 1859 the Grand Trunk extended their line from Fort Gratiot, Michigan, opposite Point Edward, to Detroit by leasing the standard-gauge Chicago, Detroit & Canada Grand Trunk Junction Railway. Connections were made with lines to Chicago at Detroit.

Docks were built at Point Edward and Fort Gratiot, and the Grand Trunk began a "break bulk" system of transferring freight, using the side-wheel steamer *W.J. Spicer* and other boats. This arrangement was time-consuming and extremely labour intensive. Freight had to be unloaded, transferred to a boat, and then reloaded on railway cars on the opposite shore. While the Grand Trunk's terminals were located at the narrowest point of the St. Clair River, it was also the swiftest point, with a current of about 8 knots. This created problems. Shipping was concentrated at this crossing and the Grand Trunk ferries had to dodge the lake boats. Also, during the winter months pack ice would drift down from Lake Huron, fouling the slips and

making navigation difficult. To overcome this tedious system, the Grand Trunk put into service a swing ferry capable of handling standard-gauge cars. This unique vessel was a barge anchored by a chain approximately 1,000 feet long and propelled by the current. By changing the anchor chain's angle of attachment, the current could be used to drive the ferry from one shore to the other.

In 1872 the swing ferry was replaced by the steam-powered car ferry *International*. Her iron hull was built by Palmer and Company at Yarrow-on-Tyne, England, then knocked down and shipped to Fort Erie, Ontario, where it was reassembled by the Grand Trunk. She was the first Great Lakes ferry equipped with three tracks and, at 210 feet in length, was capable of carrying 21 cars. Powered by two high-pressure, non-condensing engines, 30 inches by 30 inches, built by E.E. Gilbert & Sons of Montreal, she was driven by twin screws, making her the first propeller car ferry on the Great Lakes. Between 300 and 400 cars per day would be ferried on a normal day. The Grand Trunk began changing the gauge of its track from the 5-foot-6-inch provincial gauge to 4-foot-8½-inch standard gauge the same year, making interchange with its American line much easier.

By 1874 the Grand Trunk's Chicago-New England traffic had increased to the point that a second ferry was needed. Again the Grand Trunk ordered an iron hull constructed in England and had it shipped in sections to Point Edward, where it was assembled under the supervision of John

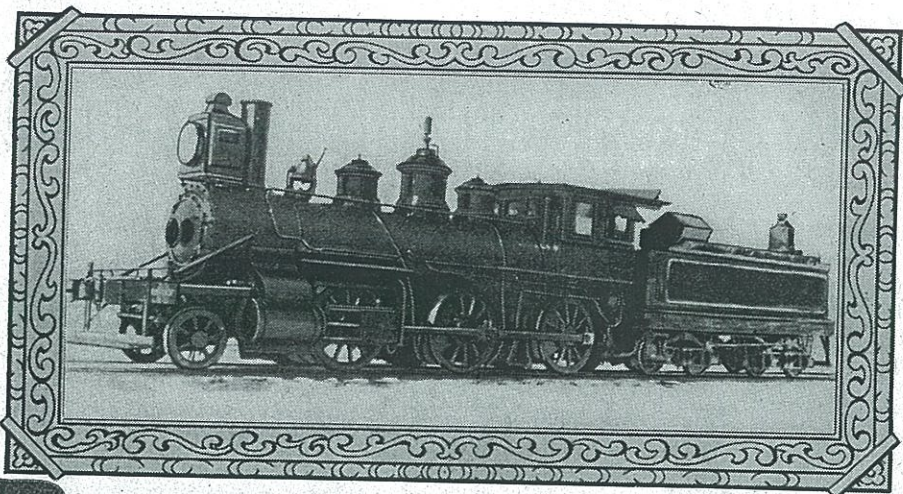


Smith. The *Huron* was launched June 3, 1875, and went into service between Fort Gratiot and Point Edward on July 1, 1875. With a length of 238 feet, she had a capacity of 24 cars, but the capacity of car ferries is deceiving. *International* and *Huron* were originally listed at 21 and 24 cars respectively. The fact that car sizes increased over the years meant that, while still capable of carrying the same tonnage, the boats moved fewer cars. This is reflected in the fact that in later years *Huron* was listed as carrying 11 cars. Even with this extra capacity the Grand Trunk was hard pressed to keep up with the transfer of freight across the St. Clair River.

Competition was developing for this traffic from the American Midwest to the Eastern Seaboard. Up to this time the Grand Trunk had made connections to Chicago by way of the Michigan Central. In 1876 William Vanderbilt gained control of the Michigan Central plus a 49-mile stretch of track between Flint and Lansing, the Chicago & Northeastern. Vanderbilt raised his rates such that the Grand Trunk was left with no viable alternative for reaching Chicago. Fortunately for the Grand Trunk, this also had the effect of drying up traffic on the short lines that connected with Vanderbilt's Chicago & Northeastern, and the Grand Trunk was able to acquire these lines. They convinced Vanderbilt to sell by threatening to build a line parallel to the Chicago & Northeastern. Vanderbilt had no choice, and by 1879 the Grand Trunk controlled their own lines into Chicago. On April 7, 1880, these lines were consolidated into the Chicago & Grand Trunk Railway. The Grand Trunk route between Chicago and Portland was now the world's longest railway under one management.

In 1882 the Grand Trunk absorbed its competitor, the Great Western. This merger included the Detroit, Grand Haven & Milwaukee Railroad, which ran between Detroit and Grand Haven, and connected with Milwaukee by steamer. This added traffic put a strain on an already overburdened crossing at Fort Gratiot. By 1883 the Grand Trunk was carrying one third of all traffic between Chicago and New England. After their victory over Vanderbilt, the Grand Trunk captured a large share of the grain trade by offering rates that the Vanderbilt-controlled lines had refused. The dressed-meat trade from the Chicago packing houses became an important source of income for the Grand Trunk, ranking third behind grain and livestock. This lucrative trade, with its requirements for icing and special handling, could not entertain the possibility of a delay. As the St. Clair River crossing was susceptible to the vagaries of winter weather conditions and the busy Great Lakes shipping traffic in summer, it became imperative that the Grand Trunk find a solution to these problems. A bridge or tunnel was the only answer. The heavy navigation at this narrow point in the river ruled out a drawbridge as being not much better than the ferry service. A high-level bridge, with enough clearance above the water to allow ships to pass underneath, would involve such long approaches as to be impractical. A tunnel was the only choice left.

As early as 1882 Sir Henry Tyler, president of the Grand Trunk, had anticipated the possibility of constructing a tunnel and had hired Montreal engineer Walter Shanley to do a study. Shanley's study recommended a site approximately three miles further downstream as being the most suitable loca-



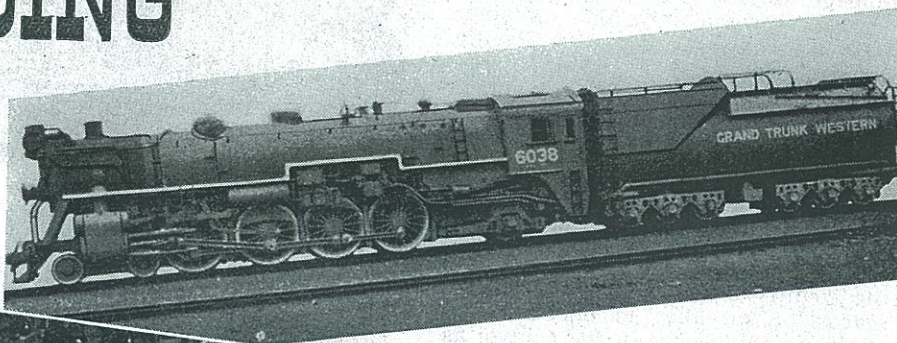
By

John C. Noel

● When the Grand Trunk came into Pontiac a century ago, it was a young railroad—just ten years old—and its locomotives, though vigorous enough, were at the gawky stage. The first was the "Sherman Stephen", a snorter which terrified horses and sprayed good citizens with mud and water. This and other primitive types, were followed by engines like the one in the photograph to the left.

RAILROADING

● Leading American and Canadian railroad men, ranking civic and state officials, and representative industrial heads in attendance at a luncheon sponsored by the Pontiac Chamber of Commerce.



● In its day, it was admired, but it seems insignificant compared with such a modern giant as the 6000 class (shown above), which hauls the famous International Limited between Chicago and Montreal. The little fellow was about half as long and weighed little more than a fifth of the giant's 300 tons plus.



ious project: for it was as early as 1830 that the Pontiac and Detroit Railroad came into being—*On Paper!* Financial difficulties were too much for those earliest incorporators, and after four years they gave up the struggle, unsung, unwept and unhonoured.

A second group dared to succeed where the first had failed. In 1834 a charter was granted to the Detroit and Pontiac Railroad by the Territorial Legislature. (Michigan had not then gained Statehood.)

Their efforts soon met with a measure of success. By the autumn of 1838 a line was laid from Detroit to Royal Oak, a distance of thirteen miles. Luxurious passenger coaches, each divided into three rooms and seating twenty passengers on benches arranged lengthwise, moved at the steady pace of sturdy horses over wooden rails which had been cut from trees along the right of way or in the adjoining forests. Double-decked cars were later tried out, but the fear of injury from the strap rails caused passengers to crowd to the upper deck, and the top-heavy cars tipped over.



● School children, granted a half holiday, turned out en masse to witness some of the ceremonies attending the event.

The first freight cars, on four-wheel trucks with springs made from white ash, were of two-ton capacity, and six of them made a train. There was no caboose, and the crew rode in the engine.

In the spring of 1841, these railroad builders had the encouragement of

seeing another two miles of track completed. Operations were extended to Birmingham, and the first steam locomotive made its appearance in the West. Christened the "Sherman Stevens," it was bought in Philadelphia, (Continued on Page 19)

ciency. The railways expect to face increasing competition after the war, and have no quarrel with such competition, provided it is fair and subject to the same regulations and control of service as they are subject to.

Summing up, may I say that the railways have faithfully and efficiently served the Nation for over one hundred years, and are prepared to do the same in the happier years we all hope will follow the termination of this war. — *Text of address delivered before Rotary Club, Windsor, Ont., Oct. 16th.*

Centenary of Railroading

Continued from Page 7

and, there being no rail connection between Detroit and the east, it was freighted by boat from Boston.

The new twenty-horsepower wood-burning monstrosity created fear and chaos on its debut, and court judgments were granted farmers against the railroad for havoc caused by frightened runaway horses. The authorities decreed the railroad responsible for fires ignited by sparks from the monster's smokestack, and every blaze within a mile or two of the right of way was blamed on that source. Claims resulting from the sudden demise of cattle which wandered on the track led to fencing of railroad property. The railway attorney was the busiest man in town.

Fodder for the iron horse was obtained along the route, and water for the boilers was pumped by hand from the ditches. In 1858 the "Sherman Stevens" was known to be still doing duty under the name of Pontiac, and at a later date was reported to be in use on the Port Huron & Owosso Railroad.

It was not until the fall of 1844 that the dream of these early pioneers crystallized and became a reality. True, the train stopped anywhere and everywhere along the line to take on, or let off, passengers, and no one could foretell with any certainty when it would reach a given place, but that was incidental. The crowning success had been achieved. A through route existed between Detroit and Pontiac. A Railroad had been born!

A year later the railroad proudly advertised: "The Company has a new and elegant car on the road, well warmed and sheathed with iron to guard against danger from loose bars."

Financial clouds continued to shadow the enterprise. Transportation was bartered for almost anything the road could use, and many farmers swapped wood for daily round-trip tickets for their children attending schools in Detroit.

On April 22, 1855, the company was consolidated with the Oakland & Ottawa Railroad Company which had been chartered, in 1848, to construct a

road from the Village of Pontiac to Lake Michigan. The new company was named the Detroit & Milwaukee Railroad, and on reorganization, in 1859, became the Detroit, Grand Haven and Milwaukee Railway. Its troubles were not over, however, and it subsequently passed to the control of the Great Western Railway Company of Canada. In August, 1882, the Great Western became a part of the Grand Trunk Railway of Canada, and in November, 1929, that railway was consolidated

with the Grand Trunk Western Railroad.

The Grand Trunk Western delegation to the centennial observances in November was headed by C. A. Skog, general manager, Detroit, and included W. H. Edmondson, assistant general manager, Detroit; E. W. Hotchkiss, treasurer, Detroit; T. E. P. Pringle, passenger traffic manager, Chicago; J. V. Maloney, freight traffic manager, Chicago; D. M. Crawford,

(Continued on Page 20)

You'll find this "FLOODLIGHT" Handy

IN YOUR HOME



IN THE GAMES ROOM



IN THE WORKSHOP



IN THE GARAGE

SPOTLIGHTING or floodlighting the games room, the workshop, garden, or the garage is simple and inexpensive with Edison Mazda Lamps. Useful in many indoor and outdoor applications, Projector Flood Lamps give unusually bright concentrated illumination. The less expensive Reflector Flood Lamp may be used indoors only. Ask your nearest Edison Mazda Lamp dealer for further details.

EDISON MAZDA PROJECTOR LAMPS



L-74

**CANADIAN GENERAL ELECTRIC CO.
LIMITED**



road from the Village of Pontiac to Lake Michigan. The new company was named the Detroit & Milwaukee Railroad, and on reorganization, in 1859, became the Detroit, Grand Haven and Milwaukee Railway. Its troubles were not over, however, and it subsequently passed to the control of the Great Western Railway Company of Canada. In August, 1882, the Great Western became a part of the Grand Trunk Railway of Canada, and in November, 1929, that railway was consolidated

with the Grand Trunk Western Railroad.

The Grand Trunk Western delegation to the centennial observances in November was headed by C. A. Skog, general manager, Detroit, and included W. H. Edmondson, assistant general manager, Detroit; E. W. Hotchkiss, treasurer, Detroit; T. E. P. Pringle, passenger traffic manager, Chicago; J. V. Maloney, freight traffic manager, Chicago; D. M. Crawford,

(Continued on Page 20)

The Grand Trunk Western Lines

P LANS for consolidation of ten of the companies comprising the Grand Trunk Railway System, subject to the approval of Michigan authorities and the Interstate Commerce Commission, were announced recently by Mr. C. G. Bowker, General Manager of the Grand Trunk Western Lines. The announcement said directors and stockholders of the companies have voted their approval and that applications for approval of the Interstate Commerce Commission and the State of Michigan will be filed immediately.

The consolidation contemplates a total capitalization of \$150,000,000, with expenditures of \$30,000,000, during the next five years for development and improvement of the lines. The new company will retain the name of the Grand Trunk and general offices will be in Detroit.

The ten companies involved, all Michigan concerns, are: Grand Trunk Western, extending from Port Huron to Chicago; the Detroit, Grand Haven and Milwaukee, operating from Detroit to Grand Haven; the Chicago, Detroit and Canada Grand Trunk Junction, extending from Detroit to Port Huron; the Toledo, Saginaw and Muskegon to Durand; the Pontiac, Oxford and Northern, extending from Caseville to Pontiac; the Michigan Air Line, extending from Jackson to Richmond; the Detroit and Huron, extending from Bad Axe to Cass City; the Grand Rapids Terminal, which is the terminal of the D.G.H. & M. Railway, at Grand Rapids; the Chicago and Kalamazoo terminal, which is the Grand Trunk Terminal, at Kalamazoo; and the Bay City Terminal, the Grand Trunk Terminal at Bay City.

A new one million dollar classification yard for the Grand Trunk Western Lines is already in construction on the Detroit, Grand Haven & Milwaukee Line, east of Woodward Avenue, between the Eight and Nine Mile Roads. Fifty-six acres of land have been purchased and the construction has been going on for the past two months. The yard will afford a 4,000 car capacity, a 20-stall roundhouse and a repair shop. The proposed yard will switch cars together in station order. All inbound business arriving will be classified for immediate delivery.

"We must get out of the busy section of the city itself to classify trains to get prompt movement," Mr. C. G. Bowker, General Manager, said. "This yard will mean prompt deliveries and elimination of congestion suffered in the past." The Nine Mile Yard, termed Ferndale Yard, will be used in connection with the Pontiac Yard, now under construction. This development also will cost over one million dollars. According to the Grand Trunk Western Lines' plans all road trains will terminate at Pontiac and cars will be handled from Pontiac to the Nine Mile Yard by transfer engines. Specially designed transfer engines of the Santa Fe type, with 100,000 pounds tractive effort, will be purchased for use between Pontiac and Nine Mile Yard.

In spite of litigation hampering an immediate start on the new Grand Trunk Railroad from Royal Oak to Birmingham, it was agreed by highway officials and attorneys here that the state may yet complete this project before winter to allow an early start next spring on the final sections of wider Woodward Avenue.

Bids have been opened and all preparations have been made for a start soon on grading the new railroad site, but work is held up by the decision of land owners to test the validity of the project in the State Supreme Court. The Court has issued a writ of certiorari bringing all legal questions before the bench, including the constitutionality of the state's contract with the Grand Trunk. About half the nine-mile stretch of right-of-way for the new tracks has been acquired out of court. Condemnation proceedings have been started to obtain the remainder, but further action has been halted by the Supreme Court appeal. The new railroad site is about three-quarters of a mile east of Woodward Avenue, much of it running through subdivision property. The

A Special Department Devoted to Chronicling the Events of the Last Month in Business, Social and Sporting Activities

original contract with the railroad was made by the legislature during the special session of 1926. This was revised by the last legislature at the suggestion of Governor Fred W. Green. Under its provisions, the state is to construct the new road bed and in return is to receive the present railroad site, which parallels Woodward Avenue and has blocked completion of the widening project. Further, the railroad is to repay the cost of the state in fifteen annual installments.

Kit F. Clardy, Assistant Attorney General, answering for the state, upholds the constitutionality of the contract and has asserted that proceedings have been in strict accordance with the law. The case will be argued early in the June term. The state plans to have all equipment and blue prints ready for a start on construction the minute a decision is handed down, providing it is favorable.

The recent announcement by the Grand Trunk Railroad that rapid transit would be supplied between Detroit, Royal Oak and Pontiac is creating a great deal of activity in the north end section adjacent to Woodward Avenue. Likewise, announcement was made that work has been started for Grand Trunk



Mr. T. C. Hudson, Assistant General Superintendent of Motive Power, of the Central Region, who has been elected President of the International Railway Fuel Association.



Captain C. H. Nicholson, Manager of Steamships and Car Ferries, Central Region, who has been elected President of the Dominion Marine Association.

shops, round houses and depots at the Nine Mile Road and Grand Trunk tracks. What has taken place in Chicago, New York and Philadelphia is about to take place in the north end of Detroit. The increase shown in land values along properties touched by this new movement would be surprising. The rapid transit between Detroit, Royal Oak and Pontiac is one of the biggest factors that has ever been announced in Detroit and it is only time that rapid transit will be the cause of an influx of thousands of people to districts far beyond those now developed. The construction of a belt line railway around Pontiac was conditionally authorized, May 26th, by the Interstate Commerce Commission. Applications of the Detroit, Grand Haven and Milwaukee Railway; the Pontiac Oxford and Northern Railroad and the Michigan Air Line Railway for the belt line were approved. A similar application by the Pere Marquette was denied. The commission approved the application on condition that construction of the belt line shall be commenced before September 1, 1928, and completed by August 31, 1929. The belt line shall be opened to any other carriers authorized by the commission to enter Pontiac, without discrimination, the decision said. Written acceptance must be filed within thirty days.

Detroit, Mich.

The Detroit Baseball Club opened the Grand Trunk Inter-City League, May 27th, at Port Huron, with a

win over the strong Port Huron Club by a score of 6 to 5. The day was rather cool for good baseball and at times the play was rather loose on both sides. However, there was one bright spot, the play of plays, the triple play. In the 5th inning, Port Huron started what looked like a promising rally, Myers being on second and McDonald on first, nobody down, when First Baseman Sieg lined to Weir at short who touched second and got the ball to Brazati before McDonald could scramble back. The batteries were: Detroit, Bowers, Marchand and Magness; and Port Huron, Kuschell and Carrier.

Detroit's next Inter-City game is at Battle Creek, June 17th. Saturday, June 23rd, the team journeys to London, Ont., playing the Orange Crush team, of that city in the afternoon, then jumping to Chicago for a regular Inter-City game, Sunday morning, June 24th.

Catcher Copper had the index finger of his right hand split open by a foul tip during a practice game and it is doubtful if he will be able to get in any more games during the season.

Work has been resumed on the Dequindre Line Grade. Separation work excavation will entail Gratiot Avenue to Hale Street on the D.G.H. & M. Railway. The old land mark for the Gratiot Avenue depot is a thing of the past. Passenger train schedule stops at this station were discontinued recently. In future years it is highly probable that a suburban station will have been erected in the anticipation of the proposed electrification for suburban service, contemplated between Pontiac and Detroit.

Horse shoe pitching sponsored by the Association, and under the Chairmanship of George Lundene, brought out many players and two leagues were organized of eight teams each, with two players on each team. The following are the average points per game and total ringers of the first five leading players of each league. The respective leagues have been designated as the American and National league respectively. In the American league A. Powell with 11.1, has high average points per game and also a total of 21 ringers, followed by Bubb with 11.1 points and 9 ringers; Trembath 10.1 points, and 21 ringers; Sheehan 10.1 points, and 19 ringers; Weir 10 points and 15 ringers. In the National league, Magness is high with 12.8 points per game and 25 ringers, followed by Atherton with 11.3 points, and 11 ringers, Payne 10.8 points, and 20 ringers; Warren 10.8, 19 ringers; Cassidy 9.4 and 15 ringers.

On Sunday, June 3rd, the Port Huron representative bowling team visited Detroit and defeated the local team. This sport constitutes the chief activity of the various sections of the association.

A concrete demonstration of the growing interrelation between rail and motor transportation was given, at Detroit, at the conclusion of the thirty-seventh annual convention of the Freight Claim Division of the American Railway Association. Approximately 300 of the delegates, half of whom were accompanied by their wives, boarded a Grand Trunk special train, a few blocks from convention



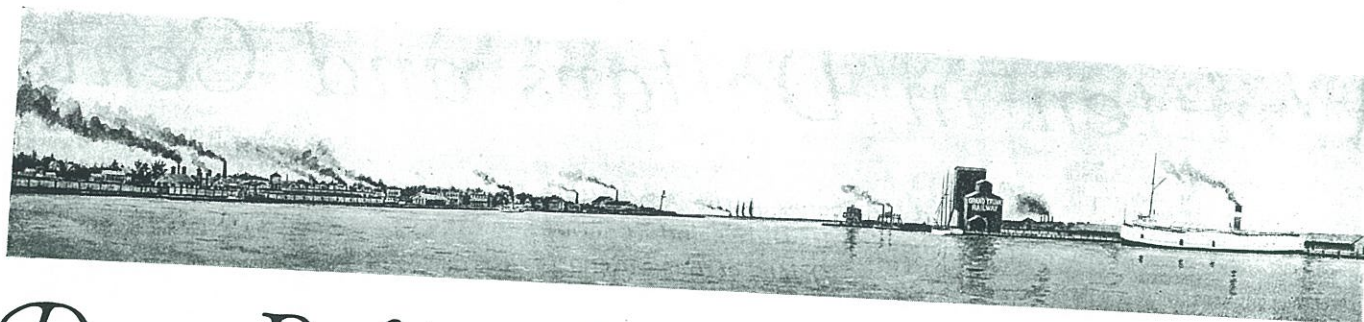
Mr. C. E. Smart, Chief of Car Service, Montreal, who has been elected Chairman of the Mechanical Section, American Railway Association.

headquarters, at the Book-Cadillac Hotel. The train carried the group 25 miles out to Pontiac, Mich., where the visitors were guests of R. L. Reese, Traffic Director of the Oakland Motor Car Company.

They inspected the big Oakland and Pontiac plants, ate lunch in the Pontiac cafeteria to the music of the Oakland Motor Car Company band, and then were ready for the second half of the day's entertainment—a trip by motor bus to the General Motors Proving Grounds, at Milford, Mich.

Twenty-one buses were required to accommodate them. Two hours were spent viewing the operation of the General Motors "outdoor laboratory." The delegates were driven around the three-mile "speed loop," where cars are run wide open in ruthless night and

(Continued on page 41)



Days Before the St. Clair Tunnel

Old Times and Old Landmarks of More Than Forty Years Ago Recalled at the Sarnia and Port Huron Terminals

RAILROAD operation has undergone many changes during the past four decades and possibly no greater milestone of progress can be found than that of the St. Clair Tunnel, connecting Sarnia, Ont., with Port Huron, Mich. Many of the older employees at those two terminals will remember the epochal event when work commenced on the tunnel, in September, 1888, and its opening for freight traffic, in October, 1891, and for passenger service two months later.

With the construction of the tunnel certain old landmarks disappeared and time brought further changes. The old days, however, have been recalled by Mr. W. G. Larmour, now a resident of Norfolk, Virginia, but who served his apprenticeship at the old Fort Gratiot shops, of the Grand Trunk Railway, at Port Huron, in the early nineties, and who has contributed two drawings, reproduced on this page, showing the terminals as they were in the days before the St. Clair tunnel was constructed. Mr. Larmour writes the following description of them:

In the wintry scene, looking down the St. Clair River from a point on the beach on the Michigan side, the old Point Edward passenger station is shown on the extreme left. The older employees will have pleasant memories of this old station with its comfortable accommodations, and of the genial and courteous Agent, Walter Wily; of Mrs. Watman, the kindly housekeeper, and also of the Irish Sergeant Phibbs, depot policeman and hero of Balacava. Many are the interesting yarns he could tell of that memorable fight, and personal interviews with Field Marshal Lord Raglan, the Commander-in-Chief of the British army during the Crimean war.

On the upper floors of this building were fine rooms with sleeping accommodations and office facilities for the use of visiting officials. A spacious covered balcony commanded a beautiful view of Lake Huron and the river, with the constantly passing shipping in the open season.

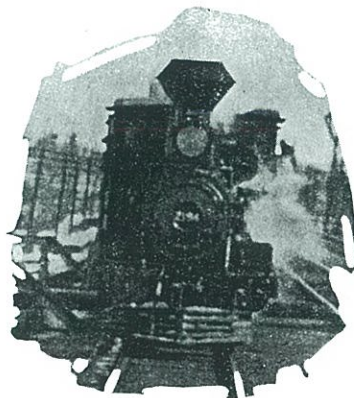
From the station is seen, in order, the one story building used for freight offices, the upper ferry slip or "girders", the grain elevator, freight sheds and lower slip, with the wood-burning ferry "International" moored therein.

The ferry "Huron", assisted by the ice-breaking tug "M. F. Merrick", is shown fighting her way across the river through the floating ice. The black smoke pouring from their stacks, with the "exhaust inside", indicates that they are up against a real job, and are being worked to full capacity. Captain John Egan is in charge of the "Huron" and the famous, one-armed Captain Smith is on the "Merrick". It has been said of the latter that he could pull more bells with his one arm than any two-armed skipper who ever paced a deck.

The river, at this point, never really became frozen over, on account of the swift current, but occasionally

it had become so filled with floating ice from Lake Huron, that the ice became stationary, and, with low temperature, knit together, so that people could walk across for three or four days at a time.

These occasions were rare, however, the ice generally being kept on a steady march down the river by the powerful current. It has been known to flow in this



manner for a month continuously, with open water occurring only for short intervals. Such times were busy ones for the car-ferries, with freight congesting on both sides, and with conditions between Detroit and Windsor not much better, so that diversion of traffic to those points did not help the situation very much.

In those days, Point Edward was the Canadian terminal of the Grand Trunk main line from Montreal and Toronto, and, after the amalgamation with the Great Western, the connection between the two roads from Point Edward to Sarnia, along Sarnia Bay, was built (about 1884), when freight crews commenced running "around the horn", via the Southern Division eastbound, and the Northern Division, returning westward.

On the Michigan side is shown the lower "girders", the freight sheds, Botsford's elevator, Pine Grove Park and the Port Huron water works. The passenger trains operating between Fort Gratiot and Detroit ran along the river bank at this point, using the right of way of the narrow-gauge Port Huron and Northwestern Railway by means of a third rail.

Built by Smith, at Point Edward, in 1875, (and still in service between Detroit and Windsor) the ferry "Huron" has had many varied trails and vicissitudes during her long career. Several times she has been carried miles down the river in ice floes that proved too heavy for her, and, on one occasion, in the fall, during a South-west hurricane, was actually blown out into Lake Huron and given up for lost in the heavy sea, searching tugs failing to locate her and reporting her foundered with all hands. She had, however, taken refuge behind Kettle Point, and, the next afternoon, came steaming triumphantly back to her job, having crossed the lake to the Michigan side, and worked down under the lee of the land, with a couple of box-cars hanging over her bow. She had run short of fuel and was being fired with lumber, torn from joiner-work in the crew's quarters below.

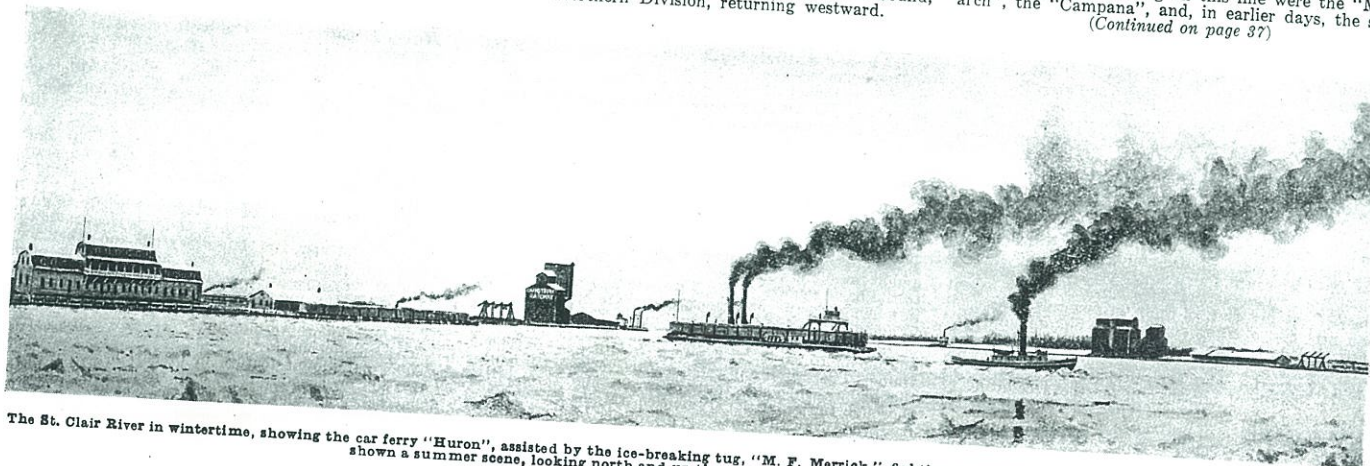
Perhaps some of the present day grandfathers, who were formerly apprentices in the Fort Gratiot Locomotive Shops and also members of the Port Gratiot Boat Club, will remember and recognize the run-way shown in the lower right-hand corner of the picture. This run-way connected with a shed (not shown) which the Company allowed the boys to use for a boat-house, and which was formerly used as a bath-house for immigrants passing through on their way West. A strong fence, enclosing sufficient space in shallow water, was erected on the beach, and whole train loads of people soured themselves overboard in the clear water, while the car cleaners washed out their train, after which the passengers resumed their journey, fresh and clean.

In the summertime scene, looking north and up the St. Clair River from Botsford's elevator, is a view of Fort Gratiot, at a time when it was a busy terminal.

Appearing in the order named, left to right, are the locomotive shops, car ferry "International" in the upper slip, the station building, the well-known "Arthur House", Denny Kerrigan's foot-passenger ferry "George Stauber", the Port Gratiot water-works, "Block I" car shops, Fort Gratiot lighthouse, and, finally, the broad expanse of Lake Huron, with a tow of three coal-laden schooners, on their way up the lakes.

On the Canadian side is seen the Point Edward station, the car-ferry "Huron", the grain elevator with a schooner unloading, the locomotive shop, the freight loading and the Beatty Line steamer, "United Empire". Other steamers operating on this line were the "Monarch", the "Campana", and, in earlier days, the side-

(Continued on page 37)



The St. Clair River in wintertime, showing the car ferry "Huron", assisted by the ice-breaking tug, "M. F. Merrick," fighting their way across the river. At the top of the page is shown a summer scene, looking north and up the river, showing a view of Fort Gratiot.

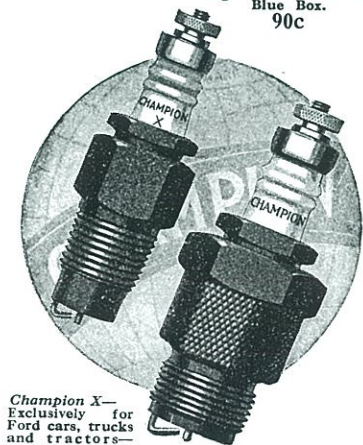
Better

FOR YOUR CAR ON TOUR

Your enjoyment on tour this summer will be made more certain if you install a set of dependable Champion Spark Plugs before you start. Your car will perform better under all driving conditions, because every dependable Champion Spark Plug is of two-piece, gas-tight construction with sili-manite insulators and special analysis electrodes. That is why two out of three motorists the world over buy Champions regularly.

Car manufacturers recommend, and hundreds of thousands of motorists are changing spark plugs every 10,000 miles to insure better and more economical car operation. This is true, even of Champions, in spite of their world-wide reputation for remarkable long life.

Champion—
for trucks, tractors and
cars other than Fords—
and for all stationary
engines—packed in the
Blue Box.
90c



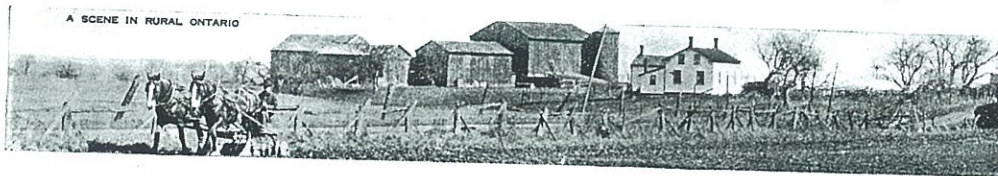
Champion X—
Exclusively for
Ford cars, trucks
and tractors—
packed in the
Red Box.
80c

CHAMPION SPARK PLUG CO.
OF CANADA, LIMITED
WINDSOR, ONTARIO

CHAMPION

Spark Plugs

A Canadian-Made Product



The Grand Trunk Western Lines

A Special Department Devoted to Chronicling the Events
of the Last Month in Business, Social and
Sporting Activities

Pontiac, Mich.

FOUR new locomotives are now in service over the miles of tracks which the Grand Trunk Railway has built to serve Pontiac industries. This now makes fourteen locomotives in the Pontiac Yards. But the four latest additions are the pride of the lot. Huge, powerful engines, which, seemingly without effort, can move a hundred loaded cars. This year the Grand Trunk purchased ten of these yard engines and Pontiac was given 40 per cent. of them. Of the other six engines, four went to Flint and two to Durand. Pontiac is the third station in revenue of the Grand Trunk stations in the United States. It is ahead of Chicago, ahead of all but Detroit, which is first, and Flint, which is second.

Two of the new locomotives will be assigned to the Pontiac plant of the Oakland Motor Car Company. The other two will go into general service in the train yard. The four large engines released by these new locomotives will be assigned to the Wilson Foundry & Machine Company, and the General Motors.

These locomotives, built by the Lima Locomotive Works of Lima, Ohio, are especially constructed for yard work. They have small driving wheels, are capable of much speed and are rated as 50 per cent. engines, whereas the best of their predecessors in the Pontiac yards are rated as 45 per cent. The boilers carry a pressure of 220 pounds, 40 pounds greater than the others. All the newest improvements are included in their equipment, from a new four-speed oiler to a fire hose that forces cold water through the hose instead of the hot water previously used, with its accompanying danger to the nozzle man.

Twenty-two new tracks are in the process of construction, north of Johnson Ave. A steam shovel, put into service two weeks ago, is cutting through a sand hill at the north end of the yards, levelling it and filling a swamp. Across the swamp two scraggly willow trees mark the spot where, in 1928, a new round-house will be built.

The steam shovel is attended by a score of dump cars, which, loaded, are pushed along a temporary track above the swamp and, with the pressure of a button on the pneumatic mechanism, spill their loads. The piles of sand are graded with an automatic leveler.

When completed, the new yards will cover nearly 90 acres and will accommodate 5,000 cars at one time.

The tracks in the yards, cutting away from the through tracks, are built in series of fifteen. The first track will hold 130 cars, the second 128, and so on, each track two cars shorter than the one before it and the last holding 56 cars.

All this expansion is made necessary by the tremendous increase in business of the last few years. During the past three years the number of cars handled through the Pontiac yards increased nearly 122,000; from 230,688, in 1923, to 352,334, in 1926.

Mr. William J. Brett, aged 55, Car Foreman, was fatally injured, May 24th, when a switch engine struck the automobile in which he was riding at the Pleasant Street Crossing, in Oxford. Mr. Brett, one of the oldest Grand Trunk employees here in point of service, had gone to Oxford, with Mr. George Struble, car inspector. The two men were joined there by Mr. Kent, of

Rochester, who is stationed at Oxford. They had been driving east on Centre Street, parallel to the line of the P.O. and N., and turned North, at Pleasant Street. They passed around a car driven by Mr. Bennett, Oxford, which was stopped at the crossing and drove out on the tracks. Mr. Struble was driving and his view of the approaching switch engine was obscured by a string of box cars which were standing on the siding. The engine struck the car on the right side, and while it pushed it clear of the track within a few feet, Mr. Brett opened the door of the car, and attempted to jump out. He was first crushed between the car and the engine, and the wheels of the locomotive then passed over the lower part of his legs, amputating both of them. Mr. Struble was thrown clear of the car and was uninjured, while Mr. Kent suffered a gash in the forehead.

Mr. Brett was taken to the City Hospital, Pontiac, in an unconscious condition, and died shortly after. Mr. Brett was born in Hastings, England, November 18, 1871, and was educated there. He came to Pontiac from Detroit, in 1899. He was a member of the Modern Woodmen of America, the Eagle Lodge and All Saints Episcopal Church. He is survived by his wife, three children, Mrs. Elsie Shearer of

The performance was witnessed by a large audience, and all present were enthusiastic in their praise of the work of all members of the cast, which was composed of the following employees: Miss Irene Samuels, Miss Grant, Miss LaVerne Leonard, Miss Norma Shook, Miss Mildred Barnes, Miss Margaret Arnold, and Messrs. H. Schultz, Walter M. Holmes, Carl Brayton, M. McCaffery, James Armes, Robert Siller and Wm. Groh.

Ladies of the Ensemble were: Misses G. Kula, I. Jones, Alma McDonald, D. Schmidt, E. Reid, Clara Stewart, N. Shook, T. Toth, Peggy Wynkook, W. Higgins and Kitty Kline.

The play was directed by Mr. J. H. Vroman, assisted by Miss Grant, book; Mr. Edmund Meagher, music; Mr. Fred Oeffinger, dancing; Mr. James Piatt, orchestra; and Mr. J. Armes, Business Manager.

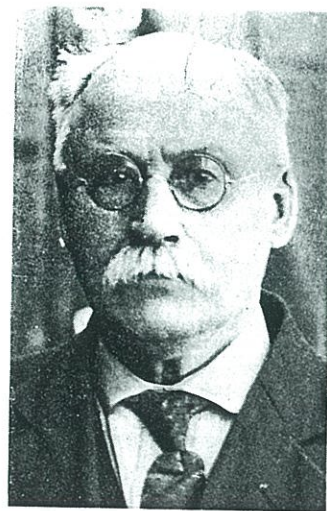
The music by the employees' orchestra was excellent, and a specialty number between the third and fourth acts, entitled, "The Devil In The Doll Shoppe," which consisted of dances of the times, by various members of the ensemble, supplemented by a burlesque dance by Messrs. R. A. Gravelle and H. Bubb, received much applause. This specialty dance number was arranged by Mr. Fred Oeffinger (The Devil) and Mr. Edmund Meagher (The Music Master).

Port Huron Terminal

Port Huron Grand Trunk Social and Athletic Association held its first-annual dinner dance, May 25th, in the local Masonic Temple, which proved a great success. Unique and individual in its decoration, the event marked one of the most delightful social affairs ever given by the Association, since its inception three and one-half years ago. The ball-room presented a most unusual scene with its canopy of multi-colored streamers, spring flowers and with the reproduction of an observation car platform at one end of the room, in the centre of which was an oval sign brilliantly illuminated with the words "Grand Trunk-Canadian National International Limited." From the platform of the car, McKanlass seven-piece orchestra played, to the pleasure of some 162 couples, consisting of employees, their friends and guests. During the course of the evening Mr. George Long, brakeman on the Western Lines, and Mr. William Warren sang several solos which met with much applause. Dinner was served in the dining room of the Temple, at tables that were decorated with potted plants and bouquets of spring flowers. Very appropriate programmes were at each plate, in which a brief history of the Association was outlined.

Honor guests were seated at one table and these included the Mayor of Port Huron, John J. Bell; H. G. Love, President of the Association; B. J. Farr, Superintendent Motive Power and Car Department; W. A. Booth, Safety Director, Montreal, and others. Mayor Bell, in an address to the guests, spoke on behalf of the city and extended a greeting to the Grand Trunk officials. He remarked that while Port Huron had many industries, none was more valuable than the Grand Trunk Railway Company. He wished the Association continued success.

The Grand March was led by B. J. Farr and Mrs. H. G. Love, after which
(Continued on page 34)



Mr. George Brown, of Sarnia, Ont. who recently celebrated his golden wedding anniversary and 60 years' service on the veteran car ferry "International". Mr. Brown is a former employee of the Grand Trunk Railway. He served as assistant engineer, from 1876 to 1892, and continued as engineer when the ship was taken over by the Pere Marquette Railway in 1902.

Pontiac, Gilbert Brett, of Pontiac, and Harold Brett, of Detroit. Five sisters and one brother survive, also his mother, who resides in England.

Detroit, Mich.

"The Touchdown", a comedy in four acts, by Marion Short, was presented by the Detroit-Grand Trunk Western Social and Athletic Association, Dramatic Section, recently, at the Moose Temple Auditorium.

Smokeless Roundhouse Under Construction

Last Word in Locomotive Housing, at Pontiac, Michigan,
Has Many Improved Features—Latest Events on
Grand Trunk Western Lines

A SMOKELESS hostelry for locomotives will be completed early this year by the Grand Trunk Western Lines, at Pontiac, Mich., on the Detroit-Chicago main line. The new engine terminal embodies features which make it one of the most modern on the continent, and a tribute to the skill of the railroad's engineers. A conservative estimate of the saving which will be effected in the Pontiac locomotive terminal owing to new features in its construction is placed at about \$15,000.

Above each engine stall in the usual type of roundhouse is a large metal canopy called a "smoke jack." This carries the smoke from the engine's fire-box, through the roof of the roundhouse into the open air. As the engines are belching forth smoke when they go into the roundhouse and also during the 20 minutes, or so that it takes them to steam up, it will be seen that these smoke jacks are necessary. Also, to be considered, is the smoke from the several engines that are kept continually steamed up should the despatcher require them in a hurry. An engine roundhouse, therefore, is generally associated with smoke, whenever engines are at home. No smoke will issue from the new locomotive roundhouse, at Pontiac, even when it is full of engines, all with steam up ready for immediate use. In designing

ing to follow it home and watch the rejuvenation—without smoke.

Its duty done for the time being, the steel mammoth points its nose to the engine terminal and awaits its coming. How different this clean fresh draught must feel compared to the muddy river water of the olden days and the old wood tub with the leaky stays! The next stop is at the new automatic, electric coaling station, all steel and concrete, with a storage capacity of 500 tons.

Somewhat refreshed, it goes to the new cinder pit, dumps the cinders and has the fire "drawn." The cinder pit is equipped with an overhead electric travelling crane. This crane takes the cinders out of the pit and stores them on the ground. During the cold winter months, these cinders will not have to be stored in coal cars as has been the custom.

A hot shower bath at the washer platform removes the dirt and dust of the road before the engine goes into the roundhouse. Slightly different from the customary shower bath, this one consists of a mixture of paraffin oil and hot water forced through a nozzle under air pressure. The jacket is now shiny, wheels and tender washed up, but the boiler is still unclean. The roundhouse is the next stop, via the three-point,

electrically operated, balanced turn-table.

With the entrance into the roundhouse is learned the secret of the absence of the smoke and smoke jacks. The engine goes to its stall with its fire drawn and, consequently, emits no smoke. In the usual type of roundhouse, before certain necessary inspections could be made on an engine it had to be fired up. This, also, had to be done before the engine returned to duty and, as mentioned before, several locomotives were kept with pressure up for instant use—all of which created smoke. The new Pontiac terminal, however, is equipped with what is called the "direct steam system."

Instead of letting the engines get cold when they come in and firing them up when necessary, a half inch tube is affixed to each engine and they are kept up to 200

pounds pressure from the terminal's own power plant, which, incidentally, burns oil and with its storage capacity 100,000 gallons, is one of the largest fuel oil plants in its section of the country.

While in the roundhouse, a four-inch bed of coal is laid on the engine's grates. When an engine is ordered out, it can leave the roundhouse immediately on the pressure it has received from the terminal's plant. Once outside, an oil torch is applied, and the engine is fired up and ready for action.

As the locomotives are never allowed to cool down, the expanding and contracting which took place where they had to be fired up with coal each time does not take place. The various inspectors can also do their work more efficiently, as they can make their tests at any time. Under the old system they had to wait until pressure was up and then they all clambered on the engine at once.

Although the building has a heating system of its own, a considerable saving will be effected owing to the radiation from the locomotives being more than enough to heat the whole place. The roundhouse has a capacity of 10 engines inside, and 10 outside. Those outside are kept at 200 pounds pressure from the central plant in the same way as inside and not being under their own steam do not require the services of a watcher during winter weather.

After the engine is washed out in the roundhouse, the boiler-makers blow out its flues with air and caulk any leaks. The machinists inspect the bolts, nuts, and other working parts to see that they are tight and safe for the next trip. The air brakes are tested and the electricians ensure that the headlight is burning brightly. The machinists go over the running gear and the boiler-makers O.K. the boiler. Clean inside and out, all parts working perfectly, the engine is only waiting an order from the despatcher to be away again.

A more detailed description of the mechanical features of the roundhouse follows:

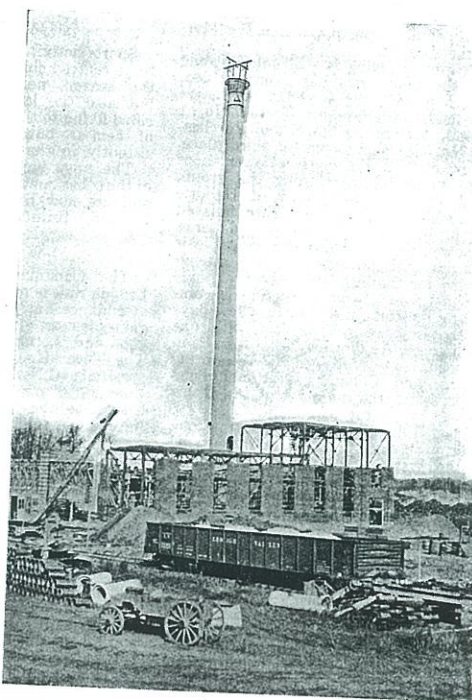
The exterior walls of the roundhouse are constructed with a reinforced concrete framework and shale brick curtain walls. The interior framework is a heavy timber construction with bolted and dowelled corbels and bracing with two-inch wood sheathing for roof construction, covered with four ply, built-up asphalt roofing. The roundhouse is designed to admit a maximum of light, hot galvanized steel sash being used on all outside walls and extra heavy wood sash in the roof lantern which is located at the end panel from the engine doors in order to light the mid section of the roundhouse. The engine doors are constructed with steel framework wood panels, Canadian National Railways standard.

No smoke jacks are provided due to the direct steaming system, but each stall is equipped with stationary type roof ventilators.

The toilet facilities are provided in a separate building reached from the roundhouse by a separate corridor. There are separate facilities for firemen and engine house employees.

The power and boiler plant consists of a single building of structural steel framework and brick walls of fire-proof pre-cast cement tile covered with standard built-up asphalt roofing. On the boiler end, the height is increased to give the additional head room required. No dividing wall is provided for the machine end, which, however, is grouped adjacent to the roundhouse at which point it connects with the roundhouse by an enclosed passageway.

(Continued on page 34)



View of the new Pontiac roundhouse while under construction.



The new roundhouse, at Pontiac, Mich., as it nears completion. At the right is seen W. G. Heggie, Field Engineer, who with Anthony Nadrach, of the Mechanical Department, were in charge of construction.



the new roundhouse the engineers have been able to eliminate all smoke jacks through which the smoke can escape. Owing to the lack of smoke the interior of the engine house will always be as clean as a well-ordered machine shop.

An important factor in the new design is the saving of coal required to steam up an engine before it leaves a roundhouse. An additional savings effected is that of \$3 per engine on washing the locomotives. In winter, engines standing outside a roundhouse are kept with steam up and a "watcher", at 45 cents an hour is required. No watchers will be required at the Pontiac terminal.

Not only will the new engine terminal edit the handling of locomotives and save a railroad a considerable sum of money, but its smokeless nature will be welcomed by the residents of the community.

How can an engine house get along without making smoke? A heavy freight is just pulling in from Chicago. The locomotive has just completed a hard run. It will be interest-

Enemies

of Eyes are sun, wind and dust. Fight them!

When your Eyes become bloodshot from the irritating effects of wind and dust, use *Murine*. It quickly relieves this unattractive condition, as well as Eye strain caused by the glare of the sun. This long-trusted lotion contains no belladonna or other harmful ingredients.

MURINE
FOR YOUR
EYES

Pains in the Back

Thoroughly massaged with Minards', backache will disappear.

MINARD'S
"KING OF PAIN"
LINIMENT

ARLAC

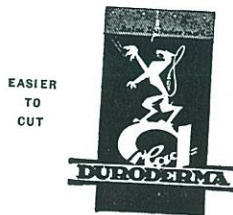
DRY PROCESS STENCILS

Insure

Cleaner, Faster Duplication

Just mention make of duplicator you use and we will send you samples of the latest Arlac Dry Stencil.

Do this now if you desire to improve your duplicating as well as save time and money.



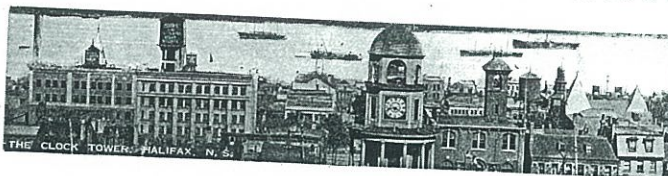
Stencils Limited

42 St. Sacrement St. Montreal

COUPON

STENCILS LIMITED,
42 St. Sacrement St., Montreal.
Please send me, without obligation, samples of
Arlac Stencils for Duplicator.
Name Company
Address
C. N. R.

"Willie," said his mother, "I wish you would run across the street and see how old Mrs. Brown is this morning."
A few minutes later Willie returned and reported:
"Mrs. Brown says it's none of your business how old she is."—*Boys' Life*.



Grand Trunk Western Lines

Events of the Past Month as Chronicled by
Correspondents on Lines in
the United States

Pontiac, Mich.

With the completion recently of the twenty-car storage track on the plant site of the new Yellow Truck & Coach property, the Grand Trunk Railway finished another unit in its \$3,000,000 Pontiac construction program for 1927. Total trackage to be laid during the year, made necessary in order to handle the increased traffic demands, is between eighteen and nineteen miles. When these units are completed the railroad company will be able to handle an average of between 2,000 and 3,000 cars in and out of Pontiac daily.

Sixteen tracks are being built in the west Pontiac Yards, including double tracking, switching leads and an extension to the east-bound double track now in use, extending over one mile. Between ten and eleven miles of tracks will make the completed unit.

In the north Pontiac yards, which will serve the Pontiac plant, there are being built seven tracks, which will add between five and six miles to the total project.

The Belt Line construction is well under way, and when completed will divert much Grand Trunk rail traffic around the business district of the city and connect with the main line, thus relieving the present switching conditions in the down town sections and stopping congestion of the streets.

Exclusive of the work contemplated to handle the business of the new Yellow Truck and Coach Manufacturing Company, there are now between eighteen and nineteen miles of trackage under construction. When completed this will mean that the Grand Trunk will be able to handle between 2,000 and 2,500 cars in Pontiac daily, against the 1,300 to 1,600 now being taken care of. The storage capacity will be between 2,800 and 3,000 cars in the Pontiac Yards.

The total expense of the Grand Trunk's program in Pontiac for 1927 is approximately \$3,000,000, which includes the work now being done, land and other purchases, trackage, grading and construction. The cost for the year in trackage and grading alone amounts to between \$1,125,000 and \$1,500,000. This does not include any of the projects planned for the Yellow Truck & Coach plant. This amount, that is, the Grand Trunk's improvement expenses, may be increased over these figures from time to time as conditions warrant further expenditures.

The storage track on the Yellow Truck & Coach plant completed recently has a capacity of 20 cars and will take care of the immediate needs of the Company.

Further work will be started soon and we will be ready to handle all business then simultaneously with completion of the factory building.

Milwaukee, Wis.

"Stand by to cast off," megaphoned the skipper, and with a lusty sea-going chantey the crew heaved the hawser and the good car ferry Milwaukee began to churn the waves, July 18th, under the nautical direction of Henry W. Ploss. During his tricks of duty on land Mr. Ploss is general agent for the Grand Trunk Railways system, and the crew consisted of 100 members of the Milwaukee Traffic club, who voyaged to Grand Haven, Mich., over the week end as guests of the Grand Trunk. While the women occupied themselves with a bridge contest for the score of prizes, the Traffic club members

were organized into watches, with Skipper Ploss, Ben Deacon, Grand Trunk press representative; Al Parr, Capt. C. E. McLaren, manager of the lake car ferry lines; E. F. Flinn and W. R. Eastman, Grand Trunk officials from Chicago, in charge of festivities. When the vessel reached Grand Haven members of the crew and their wives were given shore leave to attend a dance, which ended at midnight to allow the vessel to return to Milwaukee.

Durand, Mich.

Oren W. Britten, B.&B. Foreman, retired on pension April 1st, 1927. Mr. Britten, who is now sixty-six years old, commenced work at Battle Creek on the Chicago Division as a Carpenter, July 13, 1908, and in 1909 was transferred to the Detroit Division, becoming a



Mr. James Waugh, General Agent, Freight Department, San Francisco, California, besides being a veteran in the service, is also an excellent golfer. A leading paper in San Francisco describes him as being "the winner and a consistent first fighter," after Mr. Waugh had annexed the honors in a tournament at the California Golf Club. Mr. Waugh entered the service in 1891 and has been located in Milwaukee, Chicago, Detroit, Philadelphia, Omaha, Minneapolis, and, for the past number of years, in San Francisco.

Division Foreman. Mr. Britten's health has been poor for the last few years, and it is hoped that his retirement will aid in improving it.

Two new stand pipes are being installed at Durand on the main line west of the D., G.H. & M. diamond. One of these pipes will be used by east-bound traffic and the other for west-bound trains. When the installation of these stand pipes is completed, taking water at Durand will be greatly facilitated.

The station grounds at Durand have always been noted for their flower beds and general neat appearance. This year, too, is no exception. Travelling Florist Jensen has again spent considerable time in planning and laying out the beds and has achieved remarkable results. He also aided the village in laying out a flower bed at the foot of Saginaw Street which has greatly improved the appearance of an otherwise barren spot.

Baby's Own Soap

Best for
You and
Baby too



Wise wives serve

CLARK'S SOUPS often

THEY begin the meal well and increase the enjoyment of the following courses. CLARK'S Soups stimulate the digestion, supply the precious vitamins and provide economical nourishment. The large assortment includes Chicken—Vegetable—Tomato, etc. All meats used are "Canada Approved"—see the legend on the labels—



At Left—The Elgin Railroad Watch of the late 60's.
Below—The Elgin Railroad Watch of today.

More
Elgin Watches are
carried by railroad men
than any other make.

It was over sixty years ago that we first made watches for railroad men.

In the present Elgin Railroad Watch—the famous B. W. Raymond—is incorporated all that we have learned during these fruitful years.

It is sturdy, handsome and dependable. It is made to serve you and your railroad without fail.

The model illustrated above has a 21-jewel movement, with eight adjustments [five to position] housed in a high quality gold-filled case. It is priced at \$62.

ELGIN

CANADIAN ELGIN WATCH CO., LTD.
Toronto, Canada

Port Huron Terminal

The expansion program of the company for Port Huron Terminal is well under way and includes chiefly the extension of the yards which is necessary to handle the steadily increased traffic of the Terminal. The present yards are being expanded to Tappan Junction, about half a mile west of the present limits and include twenty new tracks. A drainage sewer 32 inches wide is being built from Twenty-Fourth Street to Tappan, a distance of approximately one mile, replacing a ditch that was formerly used to drain roadbed and yards.

The Grand Trunk Western Lines

THE fifth annual field day and picnic of the Grand Trunk Social and Athletic Association was held at Indian Lake, Mich., recently. An ideal day greeted the three thousand picnickers, as they alighted from special trains from Chicago, Port Huron, Detroit and Durand. Hundreds of others took advantage of the fine weather to motor over excellent roads to the picnic grounds. The special trains arrived at the lake about noon, and first on the day's program was lunch. Arrangements had been made to serve a special chicken dinner, at the hotel for those who did not bring their lunches; but all had been urged to bring the old-fashioned picnic basket. "Hot Dog" and hamburger stands were also liberally patronized.

The field day events were opened with a two-inning softball game between the Transportation and Motive Power Departments. George Briggs, General Yardmaster, at Battle Creek, captained the Transportation team, while Master Mechanic Fred Dick, headed the Motive Power men. The Trainmen won the toss and Capt. Briggs elected to take his first bats. Both teams scored in the first inning but the Mechanics scored two to the Trainmen's one. Then, with the bases full and two out, Walter Edmondson, pitching for the Trainmen, won his own game with a terrific drive far over the outfielders' heads. The Mechanics staged a desperate rally in their half of the inning but fell one short of tying the score. The final result was 5 to 4 in favor of the Transportation nine. Durand and Detroit, the two leading teams in the Western Lines Inter-City League, played an exhibition game which ended in a 3 to 3 tie after ten innings of air-tight baseball. It was necessary to call the game at the end of the tenth inning to permit other athletic events to be staged on the field. The game was a thriller from start to finish and an excellent example of the high class of baseball was played. Both pitchers held the opposing batsmen at their mercy and received excellent support from their teammates. Bowers and Magness composed the battery for Detroit and Polifrone and Porter for Durand. In former years the game at Indian Lake has been to settle the league championship, but this year Battle Creek, Port Huron, Durand and Detroit all have a chance for the championship with regularly scheduled games to be played. Chicago, the other entry in the league, failed to win a game, although they put up a real battle in each game. Only hard luck prevented them from entering the win column.

A challenge horseshoe match between Superintendent of Shops Love, Port Huron, and one man and Superintendent of Shops Westbrooke, Battle Creek, and one man, was won by Port Huron, 25 to 13.

Swimming and diving events, foot races, baseball throwing, tug-o-war and wheelbarrow races composed the balance of the programme.

The Kellogg and Postum Cereal Companies furnished samples of their products for distribution among the crowd; the Globe Contracting Company supplied the youngsters with balloons and hats; and the Adams

A Special Department Devoted to Chronicling the Events of the Last Month in Business, Social and Sporting Activities

and Westlake Company donated prizes for athletic events.

It is a long ride to Indian Lake from Chicago, Port Huron and Detroit, but the crowd was as large and more

Motive Power, B. J. Farr; Freight Traffic Manager E. F. Flinn; General Passenger Agent A. B. Chown; and many others.

Much credit for the success of the picnic is due to the committee in charge, W. R. Davidson, General Chairman; C. D. Harding, Grounds; J. A. Clancey, Transportation; W. H. Edmondson, Passes; K. R. Larson, Prizes and Program; G. E. Murray, Athletic Events; and H. A. Sanders, Publicity.

Detroit, Mich.

Construction of a belt line railroad which eventually

will reroute traffic in the city, relieving the present congested conditions in the business district around Pontiac, Mich., has been started by the Grand Trunk Western Lines. The project is estimated to cost \$800,000, and is expected to be ready for service August 31st of next year. The Inter-state Commerce Commission granted the Grand Trunk permission a few weeks ago to build the belt line, at Pontiac, on the condition that work would be started before September 1st of this year, and be completed by August 31st of the next. The Pere Marquette Railroad also had a petition before the Commission. Work on the

six miles of track was started, Monday, August 27th. Eventually it is hoped the entire city will be encircled by track.

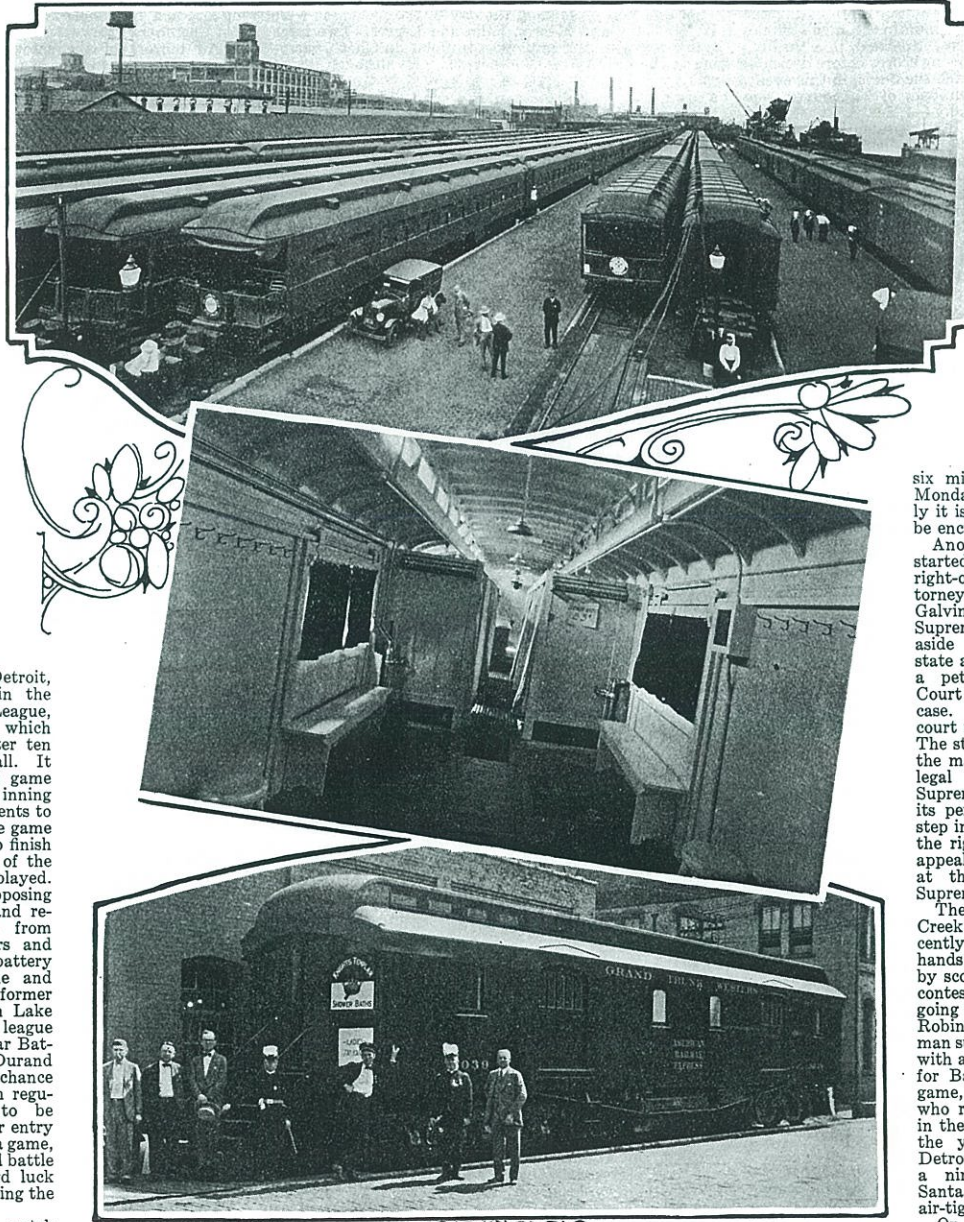
Another court action was started in the Wider-Woodward right-of-way litigation, when attorneys for Fitzsimmons and Galvin, Inc., plaintiff in a recent Supreme Court hearing to set aside the contract between the state and the Grand Trunk, filed a petition with the Supreme Court for a re-hearing on the case. In the original hearing, the court ruled in favor of the state. The state counsel are working on the mass of testimony and other legal forms necessary for the Supreme Court appeal and, in its perfection it will be another step in the long delay involved in the right-of-way litigation. The appeal probably will be heard at the October term of the Supreme Court.

The baseball team of Battle Creek journeyed to Detroit recently and met defeat at the hands of Detroit's representatives by score of 3 to 1. A very close contest was displayed, the game going into an extra innings, with Robinson, Detroit's, second baseman supplying the winning punch with a home run. Elliot, pitching for Battle Creek, hurled a nice game, with Bowers, of Detroit, who relieved Marchand, turning in the best pitching exhibition of the year. After pitching for Detroit, Bowers also chucked a nine-innings game for the Santa Maria team and pitched air-tight ball.

On September 9th, the Detroit team played at Battle Creek and lost by score of 6 to 2. Bowers hurled for Detroit and Apple hurled for Battle Creek. Detroit has one remaining game with Durand and a victory will give the Detroiters the championship and a loss will create a four-cornered tie with Detroit, Durand, Battle Creek and Port Huron, with each team 5 won and 3 lost.

Ground was broken on September 10th for the new Milwaukee Junction yard office and depot, and an up-to-date building will be constructed with all modern features and facilities.

(Continued on page 33)



When 100,000 Sir Knights invaded Detroit to attend the Knights Templar Triennial Conclave the accommodation of the city was taxed beyond its capacity and the various railways did much to lessen the congestion by parking special cars in their terminals. The Grand Trunk Western Lines' terminal, at Brush Street, was specially in the fore during the Conclave by reason of the many facilities offered the Sir Knights, including the novel idea of equipping a baggage car with shower baths. This work was done at the Port Huron Car Shops and when finished made an effective appearance in its interior coat of white paint. The success attained is indicated by one Sir Knight, who said: "There is a distinctive touch about the Grand Trunk which makes us feel more than comfortable. The atmosphere, facilities and your wonderful bath car is unique." At the top is shown a view of the yards with the special cars parked during the Conclave; in the centre, an interior view of the shower-bath car; and, at the bottom, an outside view of the same car.

enthusiastic than ever. Among the officers of the road attending the outing were General Manager C. G. Bowker; Assistant General Manager W. R. Davidson; Comptroller F. Horton; General Superintendent of

The Grand Trunk Western Lines

Port Huron Terminal

MR. H. C. WHITE, Superintendent of Terminals, announced that the 1926 business of the St. Clair Tunnel and Yards was the largest in history. Traffic through the Tunnel amounted to 467,579 cars divided as follows: Eastbound freight, 226,391; eastbound passenger 11,734; westbound freight 217,858; westbound passenger, 11,596, an average of 1,281 cars per day. In 1926 57,207 more cars were handled than in the previous year. Such an increase in volume of business has made it necessary to enlarge the tunnel yard trackage served by the electric locomotives. This overhead construction work has just recently been completed.

Winning their first basket ball game of the season by defeating the Clifford Independents by a score of 42 to 32, and losing to the Grosse Pointe Athletic Club at Detroit recently by a score of 21 to 36, makes the standing of the local club as winning one and losing two. The Grand Trunk Western Inter-City League opened January 8th with Port Huron at Battle Creek. The Battle Creek club has held the Western Lines championship for the last two seasons. The local team, under the extensive training of Coach Ike Snyder and management of R. H. Woodard, is entering the Western Lines League with keen rivalry and determination to wrench, if possible, the trophy from the "Cereal City" boys. Considerable enthusiasm is being taken in basket ball locally among members of the Association and employees, and each contest draws a good audience.

The best bowlers from this league will be selected to make up the local Association's entry in the Western Lines Inter-City League. The first game is scheduled for Detroit, January 15th. Port Huron holds the 1926 championship and Chairman Henry Kowitz is confident that his team will offer stiff competition to hold same this season.

Mr. L. F. Grass, formerly General Yardmaster at Flint, has recently been appointed to a similar position at this Terminal, succeeding the late Mr. John Shearer.

Two deaths have occurred at the Car Shops recently: Mr. Fred Dudd, age 54, steamfitter, eight years' service; and Mr. Edward G. Barrett, age 61, electrician, 16 years' service. Sincere sympathy is extended to both families of these employees in their sad bereavement.

A number of pensioners were recently invited by the Agent to take dinner with him in the cafeteria located in the basement of the Freight Station. A number responded and at the close of the dinner elected Mr. S. L. Trusler, former Superintendent of Terminals, Port Huron, as their Chairman. Each of these pensioners agreed to take three or four Canadian National Railways' Magazines and deliver them to regular customers, making an effort to deliver only to business places not covered by the soliciting freight agent, or the station forces. They also will take with them several extra prospective business cards, and at each business place they called, would mention the fact that a prospective business card was enclosed with the magazine. There are 51 pensioners located at this station and as a sample of one man's efforts, Pensioner George Weigand secured a passenger prospect for a point in Arizona, together with 14 business cards from the various firms he called on, which were in the form of a routing order, covering all the freight from the shippers.

Chicago

A new team track has been opened in connection with the Chicago and Western Indiana Railroad, at 23rd and Canal Streets, and is to be used jointly by five Chicago roads, of which the Grand Trunk Western Lines is one. Up to the present time one unit of this large team track has been completed and opened to the interested carriers, the Grand Trunk's allotment of space for

A Special Department Devoted to Chronicling the Events of the Last Month in Business, Social and Sporting Activities.

twenty cars being now in use for both east-bound and west-bound cars. This track is adjacent to the famous South Water Market, probably the largest produce market in the world, and its use by the Western lines gives the Grand Trunk an advantage which should soon be reflected in popularity as a well-equipped system in the largest railroad centre of the world. With the added advantage of this well-located trackage, the Grand Trunk has also in operation a splendid Transfer Station, at Elsdon,

The Chicago basketball team has been undergoing a few preliminary work-outs in preparation for the first contest of the season, to be played against Detroit in the "Border City," on January 9th.

The bowling team has been standing ready for its initial game against South Bend, on January 15th, but, owing to the depleted state of finances this year it is not certain whether the association will be able to maintain this team throughout the season.

At the election of officers for the year



The Japanese helped Santa Claus last Christmas by providing him with a large supply of specially selected oranges which were destined to go into some of the millions of stockings that were hung by Canadian fireplaces on Christmas Eve. The photograph shows a train of twenty special cars containing nothing but these oranges, which speeded eastward from Vancouver to Saint John, N.B., over the Canadian National Railways, some of the cars being left at Edmonton, Saskatoon, Winnipeg, Toronto, Ottawa and Montreal. Each of these twenty cars contained 2,000 boxes of oranges. Each box was made up of five dozen, so that in this shipment alone there were at least 2,400,000 oranges. These represented only the first of several larger shipments which the Canadian National Railways handled east from Vancouver from boats which docked there early in December.

which is enabling it to cope with a greater volume of business than was ever offered in its history, and it is hoped that very shortly the transfer platform will be opened to the shipping public. It is very doubtful if a better location for a public freight station could be selected in Chicago than that of the transfer platform, situated as it is right in the heart of the central manufacturing district. Shippers are now requesting that these facilities be placed at their disposal.

Preparations are now under way for the fourth annual dance to be given by the Chicago-Grand Trunk Social & Athletic Association, at the Auditorium Hotel, on February 5th. The energy with which the dance committee, under Chairman M.A. O'Brien, is working out all the details indicates that the dance should be a greater success this year than ever before in the history of the local association.

1927, held recently, the following officers were elected:—President, A. J. Elliott; Vice-Presidents, M. Gentleman and G. Thoresen; secretary, M. A. O'Brien; treasurer, Mrs. Helen Eddy; and chairmen of committees, Basketball, E. H. Debus; Bowling, W. Schmidt; Baseball, S. Dawson.

Detroit

Mr. H. L. McCaughey, General Agent, at 1259 Griswold Street, has been appointed a member of the Executive Committee for the Traveling Passenger Agents' Association, which meets in Detroit, in 1927.

Sir Henry Thornton, Chairman and President, together with Lady Thornton, visited Chicago, on December 16th. Sir Henry was the principal speaker at the Illinois Manufacturers' Association Banquet, held in the Congress Hotel, on the evening of December 16th; he also attended the Chamber of Commerce



The car ferry "Grand Rapids," which was recently launched for service between Milwaukee and the Eastern United States and Canada. It is the last word in constructive engineering of this class of steamers, being equipped for carrying passengers, with a freight capacity of 30 loaded cars. It has a length of 370 feet, and a beam of 56 feet.

luncheon at the La Salle Hotel, given in connection with the straightening of the Chicago River project.

The Detroit Basketball team has played five games in the Detroit Industrial League and is tied for second honors.

The first round of play has been completed and with two more rounds, Detroit is still in the running for the championship of the league.

The first game of the Grand Trunk Inter-City League is with Chicago, and will be played at Detroit, on January 9th.

Lansing, Mich.

Mr. Charles Bartel has retired on a pension after several years' service as Section Foreman, between Lansing and Trowbridge. Mr. Bartel first worked for the company on a construction gang that laid the double track through this section, and after working on several extra gangs, he was promoted to Section Foreman. Mr. and Mrs. Bartel are spending the winter in West Virginia.

Miss Betty G. Frost gave up her position as stenographer in the freight office to become Mrs. Victor Armitage. She was succeeded by Mrs. Winnifred E. Harcourt.

Prominent Official Called by Death

AFTER a long illness the death occurred at his home on December 31st 1926, of Mr. John Pullen, for many years president of the Canadian Express Company, and one of the most widely known express and railway men in Canada. Mr. Pullen had been ill for nearly three years and had retired from the management of the Express Company shortly after the amalgamation of the Canadian National System, in March, 1923.

Born at Shepton Mallet, England, in 1863, Mr. Pullen came to Canada while a boy and entered railway service with the Grand Trunk System at Sherbrooke, on August 13, 1877. He was employed in the office of the Assistant General Freight Agent, and, in 1879, he was transferred to Montreal to the General Freight office.

In 1892, Mr. Pullen went to Chicago, as secretary to the Freight Traffic Manager of the Chicago and Grand Trunk Railway, and, on March 1, 1899, was made Agent of the West Shore fast freight service, of the Grand Trunk, at Chicago. On August 1, 1893, Mr. Pullen became Agent of the Despatch Line, at Chicago, and on April 15, 1896, he returned to Canada, becoming Division Freight Agent of the Grand Trunk, in the Freight Department at Stratford, Ontario.

On August 1, 1897, he was transferred to Hamilton in the same capacity, and on May 1, 1899, he became General Freight Agent of the Central Vermont Railway, with headquarters at St. Albans. On May 1, 1900, Mr. Pullen was appointed General Freight Agent of the Grand Trunk Railway, at Montreal.

On August 1, 1905, he became Assistant Freight Traffic Manager of the Grand Trunk, at Montreal, which position he held until October 1, 1911, when he was appointed President of the Canadian Express Company, which position he held until his retirement in March, 1923.

Mr. Pullen's first wife predeceased him some years ago, and, in 1913, he was married to Agnes Shearer Cassils, who survives him. Mr. John Pullen, jr., Assistant to the Traffic Vice-President of the Canadian National Railways, is the only son.

Mr. Pullen was a member of the St. James', Canada, Country and Royal Montreal clubs. He was also a member and elder of the American Presbyterian Church.

The Grand Trunk Western Lines

THE Port Huron baseball club, for the second time, won the Grand Trunk Western Lines' championship, and, retains for 1927, the trophy put up for competition by former Vice-President, J. E. Dalrymple. The local club went through the entire schedule of nine contests, losing

A Special Department Devoted to Chronicling the Events of the Last Month in Business, Social and Sporting Activities



The Battle Creek Grand Trunk roundhouse champion bowling team. From left to right, J. R. Crawford, W. Neibauer, H. Gustke, Captain; G. Schuler, and A.A. Voss.

one game only to the Detroit entry. The titular game to decide the championship was played with Detroit, on the local diamond, recently, and offered the fans one of the best contests of the season. The score was seven to four, and the game went 13 innings, with both sides putting forth their best efforts to break a four-to-four deadlock from the eighth, but the Port Huron boys came through with three runs, in the thirteenth, to end the contest. Al Kuschell, pitching for Port Huron, was forced to retire, in the second innings, on account of being hit on his pitching wrist while at bat. Merle O'Rourke relieved him, allowing only seven hits and two runs in the last 11 innings. Bowers, pitching for Detroit, was found for 18 hits. The game abounded with sensational plays; but the double play, in the eleventh frame, by Otto Kowitz, centre field, to T. McDonald, at second base, who relayed to Catcher F. Lane, to catch Bowers scoring; and a seemingly impossible catch by Dudley Fields, in the thirteenth, proved the outstanding features.

The members of the champion club are as follows: Otto Kowitz, Car Shops, Centre Field, Manager; Tom McDonald, Car Shops, 2nd Base, Captain; Walter Kowitz, Car Shops, 3rd Base; Al Sheffer, Car Shops, Right Field; Al Kuschell, Car Shops, Pitcher; Merle O'Rourke, Car Shops, Pitcher; Joe Carrier, Car Shops, Pitcher; C. Ullenbruch, Roundhouse, Pitcher; Don Goodwin, Fireman, Fielder; Dudley Fields, Fireman, Short Stop; Carl Seig, Yard Office, 1st Base; F. Lane, Freight Sheds, Catcher; Frank Moore, Stores Department, Left Field; and Geo. Nye, Engineer, Coach.

The Port Huron Grand Trunk Social and Athletic Association are grateful to Manager Otto Kowitz and his club for repeating their efforts of the 1926 season, in bringing the Western Lines' championship to Port Huron. Credit is also due Charles Hammel, Scorekeeper, Car Shops, George Murray, John Enright and C. D. Fockler, Car Shops, and Gus Evert of the Stores Department, umpires, who have served willingly and without compensation. To date the local club has played 22 games including railroad league and exhibition games, winning 15 and losing but 7. An exhibition game worthy of mention was played recently with the

and, with the weather ideal, a joyful time was recorded.

The death occurred recently of Otto Kristick, clerk at the Car-Shops. He has been in the employ of the Company for the past 11 years. Mr. Kristick's death was attributed to diabetes, of which he had suffered for the past year. He was of a pleasing disposition and he will be missed among his associates.

Battle Creek, Mich.

The basketball season came to a close, crowning what proved to be one of the most successful schedules participated in by a Grand Trunk Western team in any branch of sport. The season opened with the championship team of the previous year intact, and further augmented by the addition of one experienced player.

A team was entered in the Industrial League, of Battle Creek, and the schedule of seven games played without a defeat, the Grand Trunk team thereby winning the championship. This victory entitled the team to play a two-game series with the winners of the Municipal League for the city championship. The most optimistic fan was somewhat dubious about the outcome of this series, The American Legion Hospital, winners of the Municipal League, being well coached,

and consisting of high school and college stars, who had cut a large figure in independent basketball circles in the state. The unpartisan looked upon the Legion team as easy winners, and this feeling spread to the basketball fans of the town. To make matters more strenuous for the Grand Trunk team, the series was planned for the same week that the team was to play the system representatives, at Port Huron, for the Grand Trunk Western Lines' championship. Surely any team facing the seemingly impossible task of playing three games, with two important championships hinged on the outcome, must have confidence in their own ability and a world of courage!

Before a capacity crowd the local team downed the American Legion in the first game, the score being 10-9. When the second game of the series was played, the situation was that if the Grand Trunk won, they were City Champions; if they lost, another game must be played. After a strenuous, hard-fought game, battling for two overtime periods, the local team was crowned 1926-27 city champions, by a score of 19-17. The team had accomplished the seemingly impossible task of defeating their dangerous opponents.

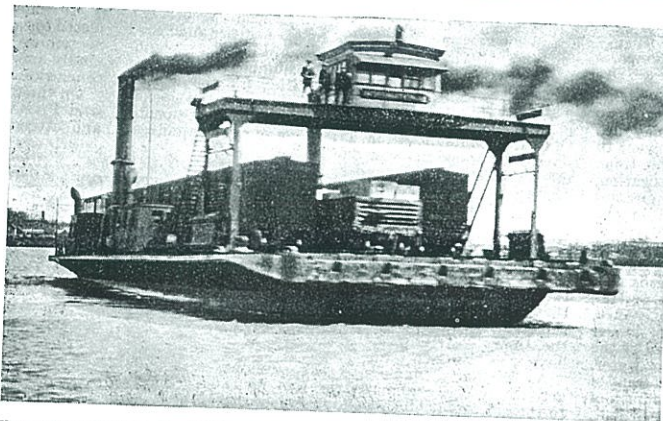
With one game to be played, the Grand Trunk Western League standings showed the Battle Creek team and the Port Huron team knotted at the top, with a record of six victories and one defeat, the Battle Creek defeat coming from the hands of Detroit, and that of Port Huron from Battle Creek by a one point margin. The game yet to be played was the Port Huron-Battle Creek game, at Port Huron. Consequently, after already playing two hard fought games, the Battle Creek team boarded the train, supported by 150 rabid fans for the Tunnel City.

Again the team participated in a bitterly-fought, neck and neck struggle. When the final whistle blew the score was Battle Creek 28; Port Huron 27. The Battle Creek team had retained their laurels and were champions of the Grand Trunk Western System for the third consecutive year.

It is a noteworthy fact that two championships were won on a margin of four points. The team, in each game, was outpointed from the field, but cashed in with remarkable consistency on the fouls of their opponents. In city league participation the official records indicate that the Grand Trunk Western representatives had fewer personal fouls called against them than any other team.

It is a remarkable record that the "Railroad Reds," as they are known, have made in local and state basketball circles. The results of the season's games are as follows:

Grand Trunk, 21—Opalume Sign Co., 7; Grand Trunk, 17—Enquire-News, 10; Grand Trunk, 19—Banks, 11;



The car ferry "International," built on the Clyde River, Scotland, and shipped across to Fort Erie, 1872, and put in the service of the Grand Trunk Railway between Port Gratiot, Mich. and Point Edward, Ont., about 1875, and continued until the St. Clair Tunnel was built in 1922. The ferry was bought by the Pere Marquette Railway, in 1902, and operated between Port Huron and Sarnia since then.

Oakman Boulevard Athletic Club of Detroit, which went 13 innings, the Grand Trunk winning by a score of two to one. Carl Ullenbruch, southpaw, employed at the roundhouse, pitched his first game of the season and blanked the visitors for eleven frames, holding them to 6 hits. He began to tire in the thirteenth innings and was relieved by O'Rourke. This game was attended by 750 fans.

Port Huron Shops

At the fourth annual Field Day of the Grand Trunk Social and Athletic Association, held recently, at Indian Lake, Michigan, Port Huron was represented by 502 employees and their families. The local band, under the leadership of David Archibald, of the Car Shops, furnished the music for the occasion. In the athletic events, Port Huron brought home the tug-of-war honors, defeating Battle Creek. In the exhibition baseball game, the local club defeated Detroit by a score of fifteen to five. George Nye, local engineer, won the fat man's race. This get-together occasion is always looked forward to with pleasure by local employees



Battle Creek basketball team, City and Grand Trunk Western Champions, 1926-1927. From left to right, back row, J. Edwards, C. Clinger, E. Jones, D. Morris, T. Maatsch, M. Gilbert. Front row, W. Polk, B. J. Farr, President Grand Trunk Western Social and Athletic Association; S. Simpson, Manager; and L. White.

while considering for supervisory material and further training or whether he should be considered to have qualified as a journeyman with little prospects for promotion. Reports on his progress should be filed yearly, at least until it has been established that he is not developing further possibilities. This will not take much of his supervisor's time and it will keep his record up to date for consideration on short notice. Men whose reports have been favorable should be so advised and it should be made known to them that they are considered as candidates for certain positions. When others are chosen first, the reason should be made known to them. There will often occur a considerable period of time after the date of graduation before a position to which the candidate is suited opens up. During this time it will be necessary to sustain the man's interest by giving him some responsibilities from time to time. To this end, he might be consulted occasionally by his superiors on shop problems as they arise, conveying the impression that his opinion is valued.

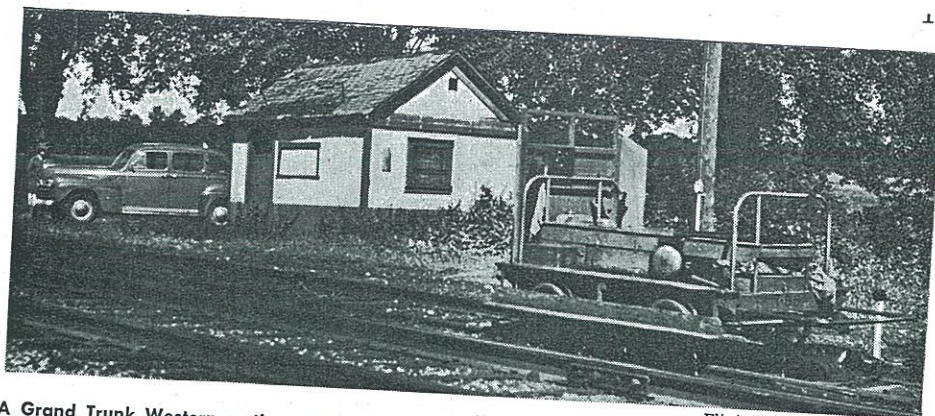
All this is predicated upon establishment of rates of pay for any supervisory position commensurate with the duties and responsibilities associated therewith which should be sufficiently above that of those supervised to make it worthwhile.

At this stage of the candidate's career he should have had some supervisory experience as a result of temporary service in positions of responsibility, which he may have been given opportunity to fill through sickness of the incumbent or which may have arisen temporarily. It may be necessary to set up situations designed to provide for the display of these qualifications. This might take the form of inspection duties on an order of new car equipment being constructed for the railroad at an outside builder's plant.

Now let us consider some of the qualifications a present day supervisor should possess, as compared to accepted qualifications of supervisors in the railroad industry in the past. Fifty years ago, choice of a man's career was made for him while he was still a boy. His experience, training and knowledge was limited to the particular branch of the trade in which he had worked a lifetime and if he was finally chosen as a supervisor, it was usually on account of his seniority, his proficiency or skill in the manual process. He supervised, largely by example, men he had known and worked with for years.

Most satisfactory results are now achieved by a supervisor who has charge of a strange band of workers of various skills impossible of mastery by one individual. He has no personal ties with his men and his qualifications should include certain attributes apart from his technical training which enables him to organize and secure co-

(Continued on page 18)



A Grand Trunk Western section crew's motor car stands on the siding at Crapo Farm, near Swartz Creek, where the owner, William W. Crapo of Detroit, has the privilege of stopping any passenger train for the convenience of his family or friends. The privilege is seldom used. The siding is used occasionally for loading Hereford show stock, for which the farm is famous, and sometimes for sugar beet shipments in the fall.

—Flint (Mich.) Journal photo

FARMER HAS PRIVATE RAILROAD STATION

By
HAROLD F. DIEHM
(In Flint Journal)



W. W. Crapo

A FARM owner with a railroad siding and station all his own, located on the main line of the Grand Trunk Western and with the privilege of stopping any train for his personal use or for that of his friends and business associates—that's William W. Crapo, owner of Crapo Farm, Swartz Creek.

Mr. Crapo is a descendant of a family famous in the railroad business of early Michigan. First of his Michigan forebears, Gov. Henry Howland Crapo, of Flint, established the farm during the great days of the pine lumbering business in Genesee County. Upon his death it passed to his son, the first William W. Crapo.

Gov. Crapo was the builder of the Flint and Holly Railroad. When it was merged with the old Flint and Pere Marquette he acquired stock in the latter company and his son William W. became an officer, serving in that capacity for many years.

The present William W. is a great-grandson of Gov. Crapo and son of the late Stanford T. Crapo, Detroit, who was Pere Marquette general manager for a long period.

The siding and station at Crapo Farm dates back to the time when the railroad was being constructed. The Chicago & Northeastern Railroad Co., incorporated in 1874, built the line from Flint to Lansing. Money was not plentiful, but Mr. Crapo, being railroad minded, and owning 1,000 acres of land through which the right of way was to pass, was willing to make a deal.

According to the present owner the deal provided that a free right of way would be presented to the new railroad in return for the privilege of building his own spur track off the main line to be maintained forever by the railroad company and two other concessions. The second had to do with the right to run the farm ditches into the railroad ditches.

"The other concession," writes the

present owner, "was that the railroad would promise to stop all trains at Crapo Farm. Some people have made a point of stopping fast trains here to reserve this right, but I have only asked the railroad once or twice to stop fast trains when we were holding a big sale or something, when it is quite a convenience for those coming to Crapo Farm from Chicago and the West."

The old station (it has been gone for many years) "used to be a place where people gathered out of the rain to wait for the next train or to wait for a carriage to come and get them after getting off the train, but now it is merely a place to house the sugar beet scales. Sugar beets are shipped out from that siding in the fall. We also ship hay, and some cattle leave and arrive from this point, mainly the show herd."

For many years the name Crapo Farm was carried on the time table of the railroad. Today many employees of the Grand Trunk, which was the successor to the Chicago & Northeastern, do not know of this contractual obligation of the railroad. But the original contract reads: "That the said railroad company, its successors and assigns shall establish and maintain a signal station on said right of way near and accessible to the present farm house, and that the passenger trains of said railroad company, passing over the above described right of way, shall stop at said station whenever requested by said Crapo, his heirs or assigns, or his agents or employees connected with the said Crapo's farm, to let off and to take on passengers at said station."—Flint (Mich.) Journal

work during the more than a month that the Abegweit was in drydock was done by William McMullen, superintendent of car ferries at Moncton.

The Abegweit is under the command of Captain John R. B. Maguire.

AN APPRECIATION FROM VANCOUVER B. of T.

Appreciation to the Canadian National Railways for their action in building the new T.S.S. *Prince George* in British Columbia and using B.C. materials wherever possible, in addition to increasing local payrolls, was expressed officially at a recent meeting of the B.C. Products and Industrial Bureau of the Vancouver Board of Trade. Bernard Allen, manager of the Canadian National Railways in British Columbia has received the following letter from A. C. Foreman, secretary of the Bureau:

"At the last B.C. Products Executive meeting, it was brought to the attention of the members, the substantial amount of B.C. materials, equipment and the large payrolls utilized in the construction of the S.S. *Prince George*.

"A resolution was passed expressing on behalf of the B.C. Manufacturers of the Bureau, their sincere appreciation to the C.N.R. for building this magnificent ship in British Columbia.

"Mr. R. A. Wyman, who is an active member and who has taken a keen interest in this Bureau's work, has kept us posted at regular intervals on the construction program.

"We sincerely wish that this ship will prove a profitable venture and that your company will consider further shipbuilding commitments for British Columbia ship yards."

GENERAL

EMPLOYEES TAKE OUT MEMBERSHIP IN R.A.

Approximately 350 employees of the Canadian National in Ottawa have been admitted to membership in R.A., Ottawa's Civil Service Recreational Association, according to A. R. McDougall, district passenger agent. These include representatives from the hotel, mechanical, express, division freight, telegraphs, operating and passenger departments.

The campaign for the drive was launched in April, following the Association's decision to welcome Canadian National employees to its membership.

Plans are now being formulated for a renewal of the

drive during the fall months, when the remaining Company employees will be canvassed for membership.

Elected to fill the vacancy on the association's Board of Directors was Arthur Hodson, assistant manager, hotel department.

MEDICAL OFFICER NAMED ALUMNI REPRESENTATIVE

Newest alumni representative on the University Board of Governors is Dr. Emmet Dwyer, Arts '24, Medicine '29, a past president of the Alumni Association.

Doctor Dwyer is in charge of medical services, Western Region, for the Canadian National Railways and Trans-Canada Air Lines. He is a member of the Executive Committee of the Manitoba District of the St. John Ambulance Association and is secretary of the Medical Study Club of Winnipeg. Other medical organizations of which he is a member are the Canadian Medical Association, the Manitoba Medical Association, the Winnipeg Medical Society, the American Association of Railway Surgeons, and the Aero Medical Association. He is a director of the Ice Club of Greater Winnipeg and plays golf at the Motor Country Club.

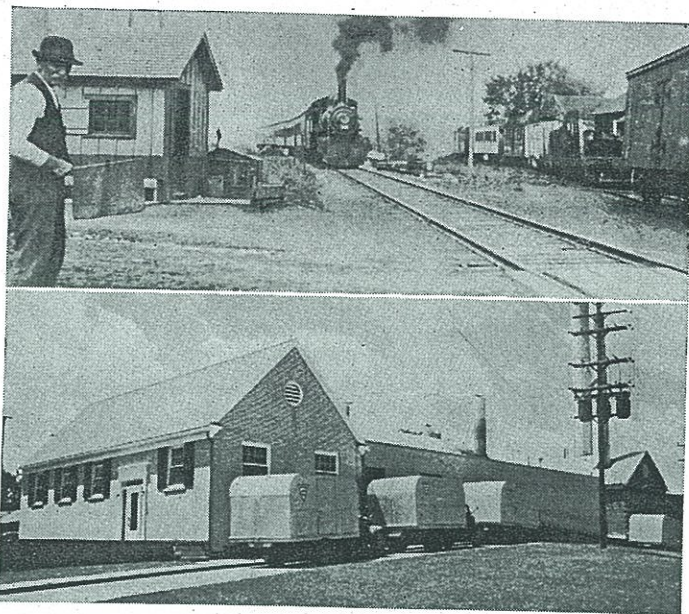
Although born in Montreal in 1903, Dr. Dwyer went to Winnipeg early enough to obtain his primary schooling at Mulvey and St. Mary's schools and his matriculation at Kelvin. He then obtained his B.A. from the University before proceeding with Medical College.

He is permanent president of the medical class of 1929 and has been an active member of the University Alumni Association Directorate since 1941 and was elected president of the Alumni Association for 1946-1947 term, when he also served as a member of the University Senate.

DEVELOPMENT PROGRAM NOW UNDERWAY IN JASPER NATIONAL PARK

A most extensive development program is underway in Jasper national park and game sanctuary. In addition to the improvement of many miles of park highways, a start has been made on a community recreational centre in Jasper village. These works are in an appropriation of \$2,300,000 for this year alone and are part of a three-year over-all program for Jasper National Park.

Work on the Totem Pole Golf Course includes the construction of three new holes and the installation of a watering system. Many of the Lodge's cabins have been refurbished.



The top picture, taken in 1926, shows Bridge St. crossing at Saranac, Mich., which was protected by Charlie Wrung, former sectionman, now deceased. By 1936, the shanty and Charlie had passed on and Flasher signals did their work. In 1946, a spur was added and since then the Saranac Milk Co., bottom picture, has averaged a car of milk product a day, turning what was an expense in 1926 to a profit from 1946 forward. The Grand Trunk Western tracks are at the bottom of slope on right. The spur is of 100-lb. rail. The pictures were submitted by Bob White, section foreman, G.T.W., Saranac.

According to Major James A. Wood, Park superintendent, an Olympic-size swimming pool at the recreational centre will be completed this year, and all grading and surfacing for the playground will be done. The pool will measure 165 feet long and 42 feet wide and will be 15 feet deep at one end and four feet deep at the other. In addition to this pool, when completed, the recreational centre will contain a wading pool for small children, six clay tennis courts; a bowling green; athletic field with track and baseball diamond; and skating and curling rinks for winter activities. The main building of the centre is now in the hands of the architect, and will contain a restaurant and auditorium adaptable to all kinds of indoor activities.

The centre itself is being built on a terraced arrangement, with the various sporting locations on different levels.

A new information building will also be established by the National Parks division of the Department of Mines and Resources. It will be located just east of the famous Jasper Station totem pole and will cost \$22,000. Attendants will be on duty 16 hours daily and will provide information on all of Canada's national parks to tourists.

Major Wood said that 30 miles of the highway south of Jasper leading to the Columbia Icefield will be brought up to standard width, that is, 23 feet of hard

or paved surface with three feet of gravel shoulders.

The highway leading from Jasper toward Edmonton will be given a hard surface of 26 feet in width, six foot gravel shoulders for a distance of 32 miles.

The upper seven miles of Mount Edith Cavell Road, 19 miles of the road from Maligne Canyon to Medicine Lake and 11 miles of the Miette Hot Springs road, all are being improved.

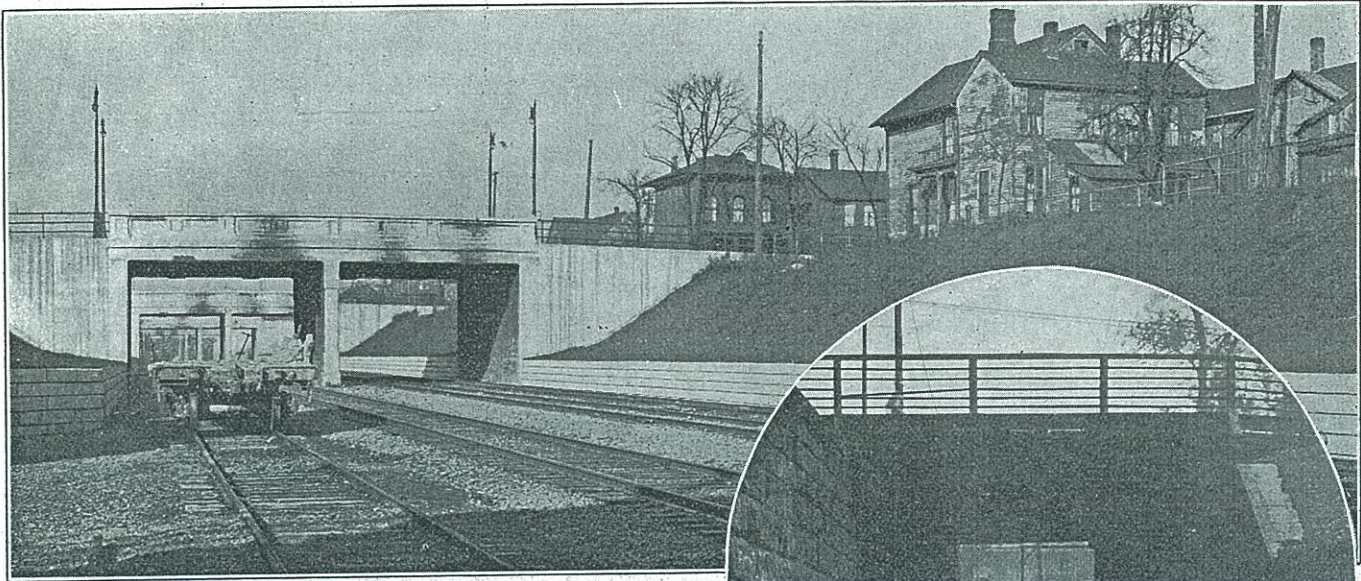
THREE INDIAN RAILMEN ON CANADIAN TOUR

India is gradually but surely mounting her internal difficulties and returning to constructive tasks befitting a proud people with a great history, according to three Indian railroad officials who visited the Central Station, Montreal, recently. They are on a one-month study tour of Canada, the United States and some European countries.

The three Indian Government Railroad representatives, Ranjit Singh, B. Sindhu and R. Krishnaswamy, praised Canada freight car production and in general the quality of Canadian railroad equipment of which they had intimate knowledge. Their tour, arranged by their government in co-operation with other governments and railroads in the various countries they are visiting for the purpose of studying different operating methods and modern equipment will also bring them to England, they said.

Track Depression Work at Detroit Imposes Many Problems

Disadvantages of this method of grade separation clearly shown in Grand Trunk's project



Viaducts of Well-Proportioned Outline Retaining Walls and Well Sodded Slopes Give the Track Depression a Pleasing Appearance—In the Insert: Gauntlet Track Through the Old Subway at Jefferson Avenue

TRACK depression presents certain objectionable features not encountered in track elevation. For this reason the railroads have generally favored track elevation as a solution of urban grade separation problems. In fact, track depression has been undertaken only in those cases where it was of particular advantage from the standpoint of track grades or where public authorities have refused to accept any other plan.

This situation is well illustrated in the Dequindre track depression project on the Grand Trunk in Detroit, Mich. Equally favorable track profiles could be had with either depression or elevation of the line and because of the inherent objections to track depression, the railroad contended for track elevation but was eventually forced to enter into an agreement with the city for a plan that provided for the lowering of the tracks. That the objections cited by the railroad were genuine and introduced many difficulties, became apparent after the work was actually under way and gave rise to the development of many special measures to meet the difficulties encountered.

Location of the Dequindre Line

The Dequindre line of the Grand Trunk is the local name in Detroit for the Detroit, Grand Haven & Milwaukee, which enters Detroit from the north and extends across the city in an almost due north and south line to the Detroit river where it terminates in the Brush street passenger station and a local freight terminal, docks and ferry slips bordering on the river between Rivard and Brush streets. The territory traversed within the city is relatively flat and the grade line, established at the time of construction during the fifties, varied but little from the natural ground level, which

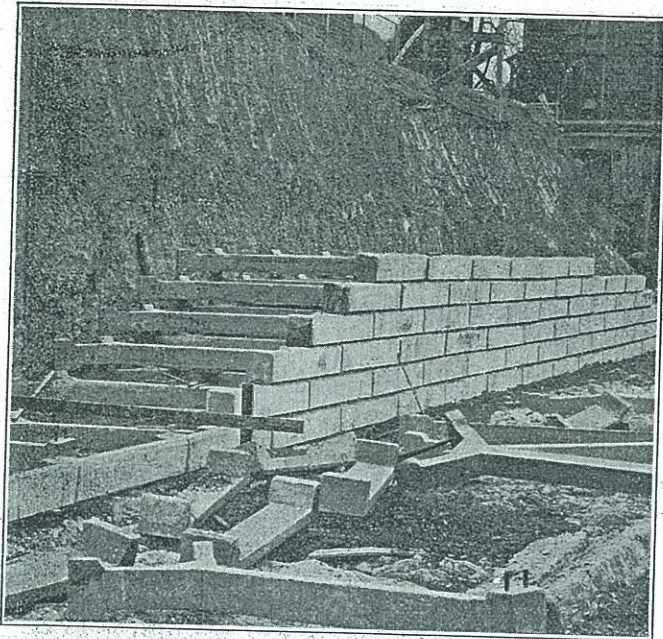
is on a gentle slope toward the river and all but three street intersections were at grade. Two of the streets are important heavy traffic thoroughfares. Jefferson avenue, 120 ft. wide, is the main traffic route from the business center of Detroit to the eastern section of the city, while Gratiot avenue is a diagonal artery extending to the northeast and comprises the southern end of the state highway to Port Huron, Mich.

Jefferson avenue is at an elevation of about 25 ft. above the level of the water in the river and occupies the crest of the slope which extends from the river bank to the general level of the city. Advantage was taken of this physical condition in 1889 to lower the track at the south end of the Dequindre line for a sufficient distance to the north to separate grades at Jefferson avenue and at the two streets immediately to the north, Larned and Congress streets. North of Congress street the track was carried out of the cut on a one per cent grade and Fort, Lafayette and Monroe streets were depressed to cross the tracks at grade in the cut. Street viaducts provided in this original grade separation project gave a vertical headroom of only 15½ ft. The timber trestles provided for this purpose at Larned and Congress streets were constructed for two tracks but the steel span constructed on stone

masonry abutments at Jefferson avenue was so narrow that it was necessary to gauntlet the two tracks under this bridge.

Made Agreement With City in 1923

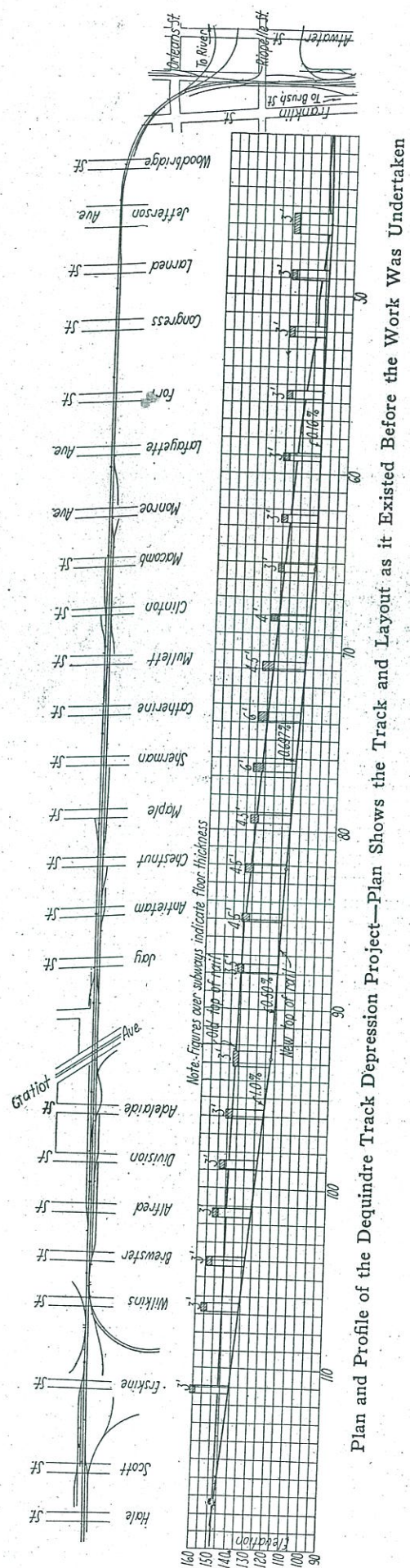
In 1923 the railroad entered into an agreement with the city for the separation of grades from Jefferson avenue north to Ferry avenue, a distance of about 2½ miles. Of this total distance the portion between Jefferson avenue and Hale street, 1½ miles, comprises a



Temporary Suspension of Work on the Crib Walls Introduced No Difficulties

track depression project requiring the construction of 22 street viaducts over the railroad. For the greater part of this distance the tracks are being lowered by practically the full amount of the difference in the levels of the track and street grades but at the north end, where the track grade runs out on the surface, several streets must be elevated to meet the grades of the viaducts, while at the south end a number of streets had to be raised to take out the dips which were introduced to effect grade crossings at the time of the partial track depression in 1889. It was also necessary to raise the grades of Jefferson avenue, Larned street and Congress street to increase the vertical headroom and provide the greater floor thicknesses necessary for modern highway structures. The established track profile calls for a maximum grade of 0.69 per cent south of Gratiot avenue and a maximum of one per cent between Gratiot avenue and Hale street.

Throughout the entire length of the grade separation territory, the railroad occupies what was originally Dequindre street which had a width of 60 ft. or sufficient for two main tracks and an industrial lead at each side where these were required. It was therefore deemed necessary to carry out the new construction on a basis that would make ample provision for four tracks on the new level, which, with an adequate spacing of the two middle tracks for viaduct bents between them, meant that the entire width of the right-of-way is occupied by tracks. The railroad was therefore confronted with the necessity for buying additional ground—either just enough for the construction of retaining walls or on adequate amount to permit of natural cut slopes.



Plan and Profile of the Dequindre Track Depression Project—Plan Shows the Track and Layout as it Existed Before the Work Was Undertaken

The second plan proved more economical and was adopted.

Cut Has Full Slope in Most Places

Along most portions of the construction district the railroad was successful in obtaining sufficient additional right-of-way, approximately 35 ft. on each side, to permit of full slopes. In some cases the slopes had to be supplemented by retaining walls for a part of the height and on one piece of property the railroad was compelled to take down part of two buildings and replace them on a wall extending to the new grade. In several instances where the adjacent property owners were reluctant to dispose of any part of their holdings, agreements were made under which the cut slopes were made on the adjacent private property with space next to the right-of-way line for a service track, in consideration of which the railroad introduced an additional span in one of the adjacent street bridges to accommodate this track.

One of the objections raised to track depression is that it exposes the line to the disadvantages of a location in a cut. For example, it was developed early in the excavation of the cut on the Dequindre line that the material encountered, sand and yellow and blue clay, had a considerable tendency to slide, a condition which gave promise of no end of trouble in maintenance. To avoid this difficulty, toe walls six feet high were built at the foot of the slope throughout a large part of the track depression territory, the space behind these walls being back-filled to form a berm about nine feet wide.

The distinctive feature of this construction is the

type of wall has been installed on this project to the extent of 26,000 sq. ft. Some of the walls are as much as 17 ft. high and the construction is said to have proved very satisfactory.

City Demanded Viaducts for all Streets

Although much of the territory traversed is a low-grade residential district in which the streets carry an exceedingly light traffic, the city authorities insisted that viaducts be provided at once for all streets intersected, notwithstanding the readiness with which additional overhead structures can be provided subsequent to original construction in any case of track depression. All of the structures provide for not less than four tracks and a few are equipped with additional spans for a fifth track. In eight of the viaducts the structure consists of a single span 54 ft. center to center of bearings, supported on concrete abutments, while the others are two-span structures supported on abutments and an intermediate bent, each span being 31 ft. center to center of bearings. The abutments are all of the mass concrete U-type, while the piers are of a thin reinforced concrete section provided with arch openings 7 ft. 8 in. wide.

All of the substructures are supported on pile foundations, using piles 50 ft. long and with a design loading of 15 tons per pile. The piles were driven by a steam hammer and received from 25 to 48 blows for the last foot of penetration.

The two-span structures were provided where minimum floor thicknesses were especially needed to avoid excessive depression of the tracks or elevation of the



Trucks Are Being Used for the Disposal of the Material Excavated from the Cut

type of wall used, not only for these toe walls but for all retaining walls, namely, Federal precast concrete cribbing manufactured by the Federal Cement Tile Company of Chicago. This cribbing is of a two-piece construction with Y-shaped headers and with stretchers so placed as to present a solid face except for slots between the courses to facilitate drainage. This construction was adopted after studies demonstrated its economy as compared with solid poured-in-place walls and because its construction offered a minimum of interference with the grading work and the operation of trains during construction. Up to the present time this

streets. In these the superstructure consists of 20-in. I-beams encased in concrete. This construction, together with the pavement, provides a floor thickness of only three feet. However, to make this possible in streets having street car tracks, it was necessary to resort to a special construction involving the use of 12-in. by 12-in. creosoted timber stringers under each rail, as shown in one of the drawings.

The superstructure of the single-span bridges consists of plate girders supporting a floor system of floor beams and stringers, framing into the girders. The sidewalks are carried on cantilever brackets and all of

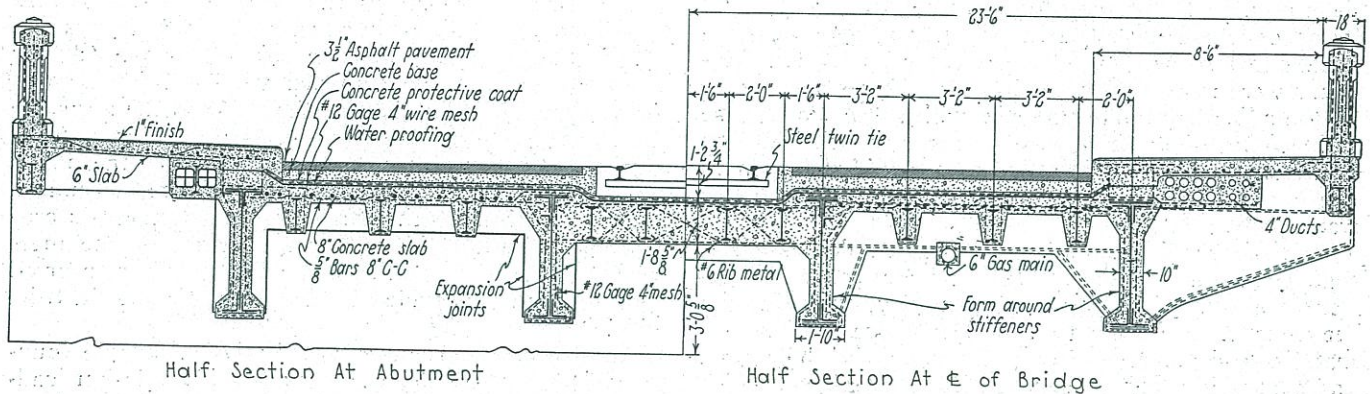
the steel members are encased in concrete while the floor is framed between stringers with reinforced concrete.

Structures Designed for Heavy Loads

The structures were designed for a concentration of 18-ton trucks, each assumed to occupy a space 9 ft. wide by 25 ft. long, with two-thirds of the weight on the rear axle and allowing 25 per cent additional for impact. The portions of structures carrying street car tracks were designed for a series of 50-ton street cars

time as temporary over-crossings to take care of street traffic during construction were provided only at Jefferson street and Gratiot avenue.

An illustration of a typical stage of the work is afforded by the conditions at the end of 1926. At that time the excavation had been completed as far north as Sherman street and all of the viaducts from Jefferson avenue to Sherman street had been completed, while the temporary run-off from Sherman street to Gratiot avenue necessitated the closing off of street traffic on



Cross Section of a Typical Floor for a Single Span Subway

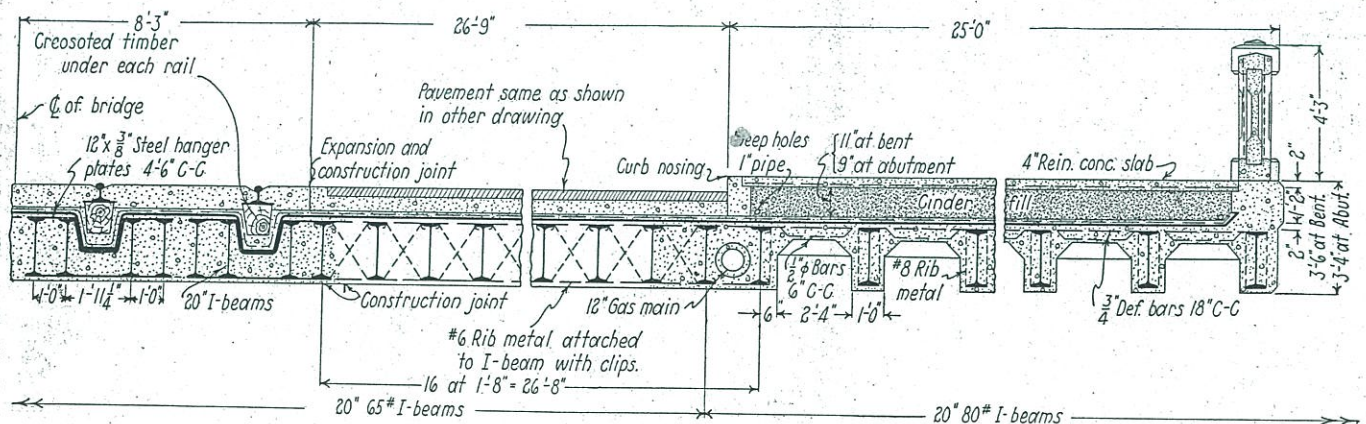
with trucks spaced 30 ft. center to center, plus 50 per cent impact. The sidewalk portions were designed for a uniform load of 100 lb. per sq. ft.

The portions of the bridge decks under the pavements are protected by membrane waterproofing covered with a protective coat of concrete upon which the paving is placed. Bridge members are protected directly over the center line of each track by a blast plate. In the earlier structures this was made of cast iron held in place by 3/4-in. bolts provided with cast iron heads. In the newer structures the blast plate is made by in-

Maple, Chestnut, Antietam streets until the excavation was carried further north and additional viaducts were completed.

How Excavation Was Handled

The excavation is being done by a Bucyrus 50 and a Marion 30 shovels, taking out the cut in two lifts of 10 ft. each with one cut on each half of the excavation for each lift. Because of the long rail haul to any point where the soil could be unloaded, the added congestion introduced by dirt trains and the complica-



Cross Section of One-Half of the Floor for the Jefferson Avenue Subway—An Example of Floor Construction for Minimum Thickness

creasing the thickness of the concrete member by an equivalent amount.

The project is being carried out in accordance with a plan under which the work was started at the south end in 1923 and prosecuted progressively toward the north, concentrating the work in any given year to a section of such length as can be carried to completion in a year's time. To this end temporary run-off grades of 2 1/2 to 3 per cent are used between the old track level and the new depressed level so that traffic will be interrupted on as few streets as possible at any given

tion of the temporary track layout in the construction district, the plan of loading the excavated material out on cars was abandoned in favor of the use of five-ton Mack trucks which haul the earth from the shovels to the river front where it is taken over by the city and carried in scows to Belle Isle for use in the extension of the city's island park. With this arrangement it had been found possible to handle traffic with but a single track within the limits of the distance in which excavation is in progress at any given time.

The material is a yellow and blue clay that breaks in

vertical cleavage planes but has to be shored where it is cut on steep slopes for the abutment construction. Pockets of sand are encountered which lead to over-breaks and other difficulties. Water also adds to the trouble and pointed to the need of a well-planned drainage system, as described later. It also resulted in several instances in a swelling action of the foundation for certain of the viaducts such that pile driving operations resulted in an appreciable lifting of some of the piles previously driven at a distance of 70 ft.

Building the Concrete Crib Walls

This foundation problem apparently had no counterpart in the construction of the concrete crib retaining walls which were placed directly on the ground, except that walls over eight feet high were set on concrete sill pieces 12 in. wide by 4 in. thick. Units were delivered in gondola cars and unloaded with a steam shovel by means of a chain attached to the dipper, being either set directly in the wall or stored temporarily in the event that the construction program interfered with immediate erection. With a force of from four to six men, divided between the car and the wall, it was possible to erect approximately 700 to 900 sq. ft. of wall surface per day. The nature of the work often made it necessary to call the men off this work for various periods of time, but such interruptions introduced no difficulties and resulted in no decrease in the quality of the construction.

On the work carried on in 1926 and 1927 a small gasoline crane has been substituted for the steam shovel in the erection of the wall unit. This crane, with two men in the car, a craneman and two men placing the units in the wall, has proved much more rapid than the use of the steam shovel, as under favorable conditions, as much as 1,800 sq. ft. of wall surface has been placed in a day of nine hours. The general average of the work with the crane, however, was approximately 1,000 sq. ft. of wall surface per day. Including a charge of seven dollars per hour for the rental of the crane, the erection cost totaled less than nine cents per square foot wall area.

All work train service within the limit of the district in which work is in progress is handled by a Plymouth gasoline locomotive in charge of a work train conductor but operated by the employees of the contractor. A side track is provided within the limits of the work on which loads are set out and empties are picked up by regular switch crews but the cars are spotted for unloading by the gasoline locomotive.

Elaborate Provision for Drainage

Drainage of the cut was given careful study and led to the development of a thoroughgoing drainage system. Three lines of eight-inch tile drain were provided below sub-grade, one on the center line of the roadbed and one outside of each outer track. These lead to catch basins on each side of each viaduct where eight-inch laterals carry the water to a main sewer laid between the two east tracks. This sewer is constructed of Massey Class B concrete pipe with tongue and groove joints, having a maximum diameter at the lower end of the pipe line of 36 in. It is carried down to the south end of the cut at Orleans street whence it follows that street to an off-fall at the river.

The roadbed is being excavated to a depth of 30 in. below base of rail and is then back-filled with 12 in. of cinders on which the track will eventually be surfaced with 12 in. of stone ballast under the ties. However, as surfacing during the course of maintenance has a tendency to raise the track and as this would result

in reducing the established headroom under the viaducts, the tracks have been surfaced at an elevation six inches below final grade line.

The track depression work between Jefferson avenue and Hale street is estimated to cost \$5,500,000. It involves 1,200,000 cu. yd. of excavation and 140,000 cu. yd. of concrete construction. Under the agreement with the city, the railroad pays 75 per cent and the city 25 per cent of all construction expense, except that each pays in full for any improvements or additions to its own facilities over those existing at the time that the work was started. The city also assumes all liability for damages claimed by adjoining property owners. Public service companies pay the cost of all changes required in their utilities.

The work is being carried out under the general direction of J. A. Heaman, chief engineer of the Grand Trunk, Detroit, Mich., the construction being under the supervision of F. P. Sisson, division engineer. A. Norman Laird is in charge of the design of the structures and originated the type of concrete cribbing used on the work. All of the work, including the track laying and surfacing, as well as the grading and bridge work, is being done under contract by W. E. Lennane of Detroit, Mich.

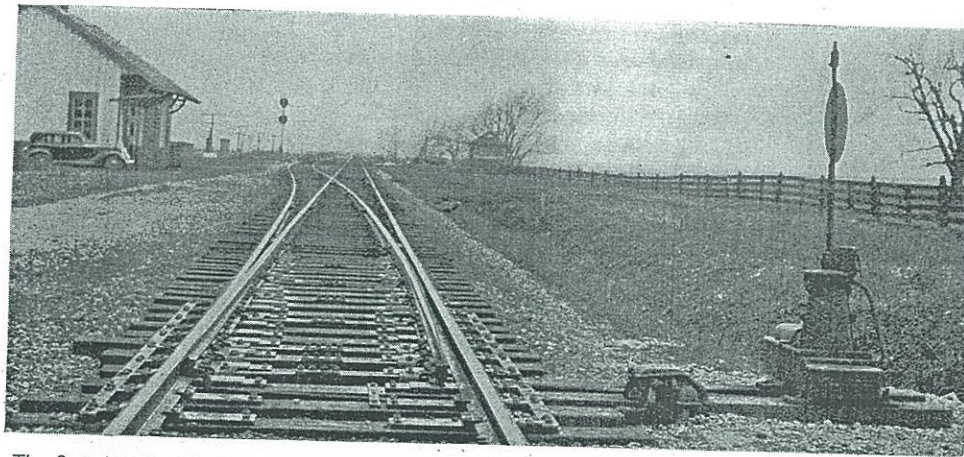
Master Blacksmiths

Meet at Buffalo

APPROXIMATELY 260 members, guests and supplymen were registered at the thirty-first annual convention of the International Railroad Master Blacksmiths Association held at the Hotel Lafayette, Buffalo, N. Y., August 16, 17 and 18, 1927. The sessions, as heretofore, were devoted to the presentation and discussion of committee reports on the following subjects: autogenous welding; carbon and high speed steels; drop and machine forging; drawbars and drawbar pins; frame making and repairing; heat treatment of iron and steel; reclamation; spring making and repairing; tools and formers, and safety work.

On the opening day, in connection with the subject of autogenous welding, an interesting paper was presented by W. J. Wiggin, North Billerica, Mass., dealing entirely with the uses of the oxygraph torch shape-cutting machine. Several lantern slides were shown illustrating the many uses to which this machine has been adapted by the railroads. Cost and time figures were given on a number of typical railroad shop jobs showing that the savings in costs varied from 18 to 35 per cent through the use of this process. As an example of the time saving element, it was shown that on a certain locomotive frame section it was possible to produce in 3½ hours with the shape-cutting machine a front section which formerly required about three days of blacksmith forging work.

Mr. Wiggin's paper created considerable discussion, the greater part of which might be summed up as an expression of skepticism on the part of some of the older members of the association as to the use of the oxygraph on certain locomotive parts, particularly side and main rods and valve motion parts. The question was argued as to whether or not the extreme heat generated by the cutting torch has a detrimental effect on the physical structure of modern steels in that portion of the metal adjacent to the cut. Commenting particularly on side rods, several members who have had a great deal of experience with the oxygraph were



The Switches Equipped With Spring Mechanisms Are Well Braced

Feb 17 1934

Centralized Traffic Control Replaces Staff System on G. T. W.

Train movements directed by signal indications—Spring switches used to eliminate mechanical interlocking—Project cost \$5,000 and saves \$6,000 annually

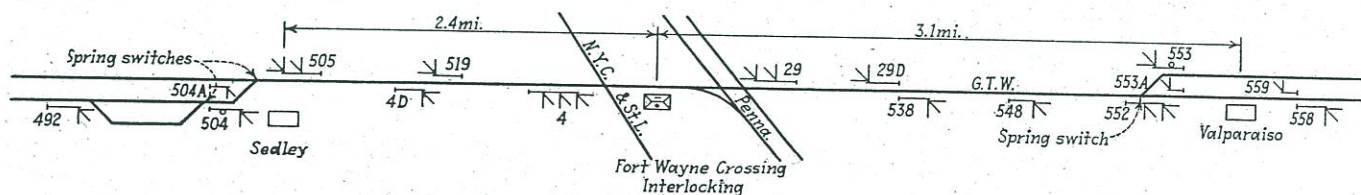
CENTRALIZED traffic control, together with spring switches, has been installed by the Grand Trunk Western to replace an interlocking and a staff system on a $5\frac{1}{4}$ -mile section of single track between two ends of double track at Sedley, Ind. and Valparaiso. When second track was built on other parts of this division in 1902, construction on this section was postponed indefinitely on account of the large expenditure required to reduce the curves and grades. In order to protect train movements over the single track, a staff system was installed and a four-lever mechanical interlocking was built at Sedley to handle the end-of-double-track switch and a passing-track switch. Operation of this plant required three men, 24 hour service being maintained. The end-of-double-track switch at Valparaiso was hand-thrown, being handled by the operators on duty at that point.

In operating trains with staff system, using an absolute block, permissive following movements could not be made. Furthermore, considerable time was lost at each end of the single track in handling the staff. In order to reduce delays and increase the capacity of this single track by permitting following moves under signal protection, it was decided to replace the staff system with centralized traffic control, whereby signals at each end of the double track would be used for directing

train movements, the signals to be controlled by a machine in the operator's office at Valparaiso. As a part of the improvements, spring switches were installed for the passing track and end-of-double-track switches at Sedley, thus permitting the abandonment of the mechanical interlocking and block office at that point. In order to eliminate delays occasioned by the operator handling the end-of-double-track switch located at Valparaiso, a spring switch was installed at that location also.

Signaling Layout

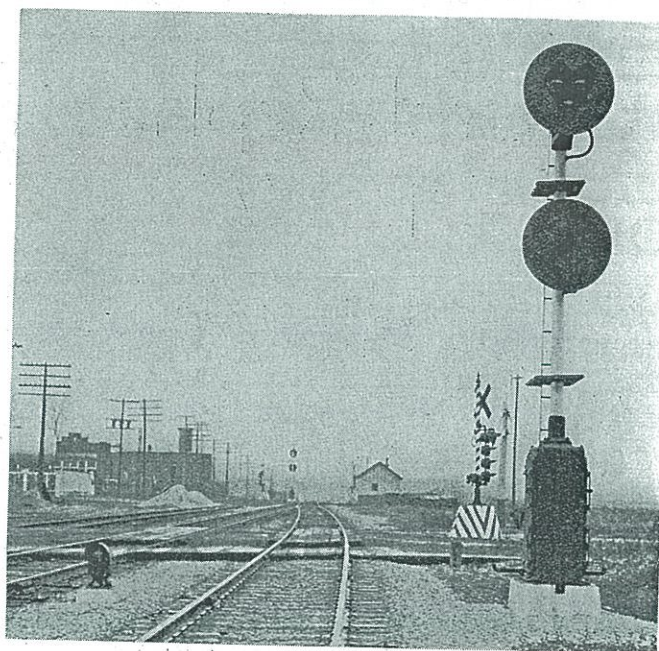
At Valparaiso, signal 553, a two-"arm" color-light signal, controls train movements from the westward main track to the single track. The top "arm" displays one of three aspects, red, yellow or green. The bottom arm is a fixed red light. This signal operates as a color-light, semi-automatic interlocking home signal, the yellow-over-red indication giving authority for a second train to make a permissive movement into the occupied block. The automatic features in the control of this aspect are such that it will not be displayed until the preceding train has passed beyond the eastward home signal at Ft. Wayne Crossing interlocking. Signal 553A, a two-position searchlight dwarf, display-



Track and Signal Diagram Showing Location of C.T.C. Territory

ing red or yellow, directs westward train movements from the eastward track to the single track.

Signal 552 is an automatic signal, the top "arm" of which has three aspects, red, yellow and green, depending on the occupancy of the automatic blocks ahead and the position of the switch. The lower arm has two aspects, red and yellow, being normally red. If the spring switch is open more than $\frac{3}{16}$ in. or if the detector track section is occupied, signal 552 displays an aspect of red-over red. Instructions require an engineman who encounters such an indication to stop and inspect the switch, and, if it is all right, to move forward on a hand signal. If the automatic block is occupied, the top arm will, of course, display red. However, even in such case it is desirable to get the train off the single track if enough track room is available, both to clear the single track so as to permit other trains



Signal 553 With Single-Unit Lower Arm

to move, and also, to prevent a train from stopping on the ascending grade.

In order to meet these conditions a "call-on" aspect was provided. The low arm is controlled only through the switch circuit controller at the spring switch and through the detector track circuit extending between signals 552 and 553-533A. Therefore, if the spring switch is closed and the detector track section is unoccupied, the low arm displays yellow. In this case, if the automatic block is occupied, signal 552 displays an aspect of red-over-yellow, a "call-on" aspect which informs an engineman that the switch is in position but that the block is occupied. This gives him authority to pass the signal without stopping, but to run at slow speed prepared to stop short of a train or obstruction.

At Sedley, signal 504 is equipped and controlled in the same manner as signal 553. Signal 504A is similar in operation and control to signal 553A. A telephone booth, at signal 504 contains a dispatcher's telephone and also a short-line telephone connecting it with the tower at Ft. Wayne Crossing and with the operator's office at Valparaiso. A train occupying the passing track must get permission from the operator at Valparaiso, in addition to a permissive indication from signal 504, before moving onto the main line.

Signal 29D, the distant signal for the westward home signal at Ft. Wayne Crossing interlocking, was changed from a three-position semaphore to a three-position color-light signal. Automatic signals 538 and 548 are newly installed color-light signals. Signal 4D, the distant signal for the eastward home signal at Ft. Wayne Crossing, was also changed from a semaphore to a three-position color-light and relocated 5,500 ft. from the home signal. Automatic signal 519 is a newly installed color-light signal. These signals are Union Type-TR.

The Control Machine

The control machine in the station at Valparaiso consists of two General Railway Signal Company interlocked desk levers with a large illuminated track-and-signal diagram. Leftward operation of levers controls eastward movements and a rightward operation controls westward movements. To clear signal 553 for a westward train movement from Valparaiso to Sedley, lever No. 1 is thrown to the right and lever No. 2 remains normal. To clear dwarf signal 553A for a westward train movement from the reverse main at Valparaiso to the single track, both levers are thrown to the right. When it is desired to give a permissive signal for a following train to enter the occupied block, the levers having been operated as explained, the operator pushes the push-button at the right-hand side of lever No. 1. The control of signals direction eastbound train movements is similar to that explained above excepting that the lever operation is different.

The illuminated track-and-signal diagram mounted above the levers reproduces the entire track layout and the location of the signals. Lights indicate the occupancy of the different track sections and repeat the signal indications. Two special lamps repeat the position of the two spring switches, being lighted when the corresponding spring switches are not closed to within $\frac{3}{16}$ in. If a line-up is to be changed, the clockwork time release, which is set at two minutes, must be operated.

The Spring-Switch Layouts

As a part of the installation of the spring switches, the switch layouts were entirely rebuilt. The two turnouts on the main line are No. 20, with switch points 33 ft. long, reinforced full length with one-inch straps and held in place by body-bound bolts. Adjustable rail braces are used on 10 ties, including the one ahead of the point. The spring-switch stands are the Ramapo Ajax Company's Racor Type 100A, and are equipped with Union Switch & Signal Company oil buffers. This spring-switch machine has two sets of springs which are arranged so that each spring tends to rotate the shaft to the normal position, i. e., with the switch-point closed. When the switch is trailed through, both sets of springs are working against pressure, but the action is retarded by the oil buffer. A by-pass is provided so that the buffer is released when the point is about one inch from the closed position, causing the points to be snapped over under full spring pressure for this final distance, thus closing the switch with a bang, which springs the point up snugly in place. When the hand-throw lever of the switch stand is lifted to throw the switch, the shaft is disengaged from the spring mechanism, so that the switch can be thrown without working against spring pressure. The spring-switch mechanism is considered as a signaling device and is maintained by the signal maintainer.

The installation of centralized control, including spring switches, has been in service since September 12,

1933, and the operating department is well pleased with the benefits in reducing train delays. When the staff system was in service, any eastward freight train running on short time ahead of a passenger train, would be held at Sedley until the passenger train reached Valparaiso. With the c.t.c. system, the freight can be run ahead of the passenger train saving from 15 to 30 min. time.

Both Sedley and Valparaiso are at higher elevations than Ft. Wayne Crossing, a heavy grade ascending from a point approximately one mile west of the crossing to the station at Valparaiso, resulting in slow speeds particularly for eastward trains. The operator at Valparaiso keeps in communication with the leverman at Ft. Wayne crossing when a heavy eastward freight train is approaching Sedley, and unless the leverman at the crossing knows that he can line up the route for the Grand Trunk train, the operator holds the train at Sedley until a through route can be lined up. The purpose of this is to permit the Grand Trunk train to run down the grade from Sedley to the crossing and up the grade to Valparaiso without having to stop in the sag. With the new c.t.c. facilities, as soon as an eastward train clears the eastward home signal at Ft. Wayne Crossing interlocking, the operator at Valparaiso can give a permissive aspect on signal 504 to let a second eastward train enter this block. This feature of the new signaling is aiding materially in reducing delays to freight trains.

The signal installation required an expenditure of approximately \$5,000 and the payroll saving in operating expenses, occasioned by the elimination of the interlocking at Sedley, is about \$6,000 annually. The installation was designed and installed by signal department forces under the direction of W. L. Dayton, superintendent of signals.

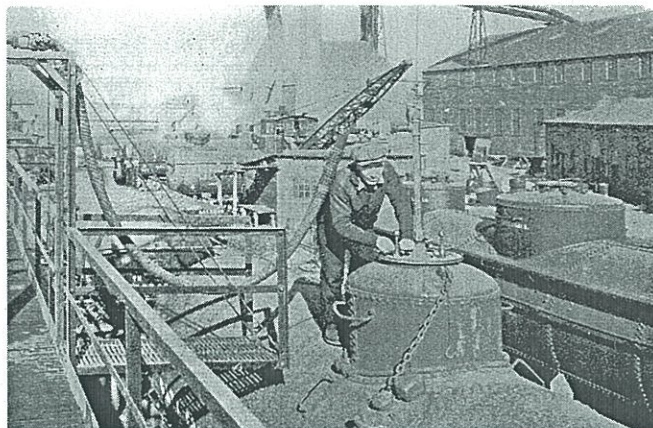
A Machine for Cleaning Tank Cars

AN automatic, mechanical, tank-car washing machine, designed and built by the Pyrate Corporation, Portland, Ore., has been thoroughly tested during the past 12 months by the Union Pacific at Los Angeles, Cal., and the General American Tank Car Corporation at Chicago. The machine is used to apply chemicals to tank-car interiors automatically and mechanically, providing cleaner cars at substantially less cost than by present hand-cleaning methods. It is estimated that the Pyrate system saves approximately 50 per cent in labor and material costs, also reducing by a similar amount the time which cars must be held out of service for the cleaning operation.

The Pyrate process involves the cleaning of all kinds of tank-car loadings in the edible and inedible oil and grease class, fuel and lubricating oils in the petroleum class, and various kinds of chemical loadings. The mechanical cleaning machine is said to do unusually effective work, enabling changes in car service to be made from one commodity to another without contamination of the lading. Another important advantage is the elimination, in most instances, of the necessity of steaming the cars before cleaning. Labor conditions in the repair yards and cleaning tracks also are improved, since it is easier to clean tank cars, and, owing to the more thorough cleaning of the cars, men using cutting or weld-

ing torches on repair work can operate with less discomfort and danger from smoke and gases.

The illustrations show Pyrate tank-car cleaning machines installed on a double-track cleaning rack at the East Chicago plant of the General American Tank Car Corporation. While two machines are included in this



Cleaning Machine Inserted in the Tank with False Dome Cover Secured in Place and the Machine Ready for Operation

set-up, it is anticipated that more will be installed at such a time as production demands warrant. These machines are leased by the Pyrate Corporation, which, in turn, supplies the chemicals required in the cleaning operation.

The Pyrate machine is made almost entirely of bronze and brass to eliminate the possibility of ignition by sparking, should the machine accidentally bump against the inside of a car containing inflammable gases. Special attention has been given to wearing parts, stainless steel being used wherever possible. As may be seen from the illustrations, the machine comprises essentially a pipe assembly extending through a false dome cover and provided with a 3-inch flexible wire-wound hose connection at the top to supply the cleaning chemical under pressure, a standard steam hose connection at the dome cover for use when it is necessary to steam the cars, a series of four stationary nozzles just below the false cover used in cleaning the dome and a pair of rotating nozzles at the lower end of the pipe for cleaning the interior of the main tank. These lower nozzles revolve slowly in a vertical plane and also in a horizontal plane under gear drive from a small turbine, thus cleaning effectively all interior parts of the tank.

The machine is supported by a counterweight from a swing crane over the cars, thus permitting its ready application to, or removal from, the tank-car dome. The dome cover is clamped in place by means of wing nuts and adjustable clamps. An adjustment feature permits lowering the revolving nozzles to the proper position near the center line of the tank, regardless of the tank's size. The dome cover also is designed to fit all standard sizes of dome openings. All projecting parts of the machine are well guarded against any damage which might occur in handling.

During the actual cleaning operation, the prepared chemical solution, contained in tanks below the ground, is forced, by means of a steam pump, through pipes into the machine and out of the rotating nozzles in two concentrated streams under 150 lb. pressure. At this pressure and with the nozzle size and design provided, the two streams of a chemical solution can be thrown, in practically a straight line, a distance of over 60 ft.

Grade Separation at Detroit, Grand Trunk Railway

Four-Track Cut in Right-of-Way on Public Street
Requires Twenty-two Bridges at Consecutive
Streets—City Pays Part

TRACK DEPRESSION instead of track elevation and sharing of expense by both the city and the railroad are notable points in the grade separation work of the Grand Trunk Ry. at Detroit, Mich. The railway enters Detroit by a 60-ft. right-of-way on Dequindre St. from Hale St. to Jefferson Ave., within a short distance of the river, where it makes a right-angle turn to reach the Brush St. terminal station. This separation of grades on the Dequindre St. line has been

city of Detroit has obligated itself to pay part of the construction cost. In all previous grade separation work at Detroit, the entire cost has been paid by the railroads and even under favorable conditions the expenditures have not exceeded \$200,000 annually. But the 1923 contract involved an expenditure of approximately \$560,000 and it is anticipated that similar agreements will be made with other railroads. No restriction is made in the agreement as to the amount of money the railway company can spend in any one year. It is provided that the work shall progress at a rate of not less than two streets annually and that the entire work as far as Hale St. shall be completed by the end of 1933.

Except where special provision is made, the city is to pay 25 per cent and the railroad 75 per cent of the

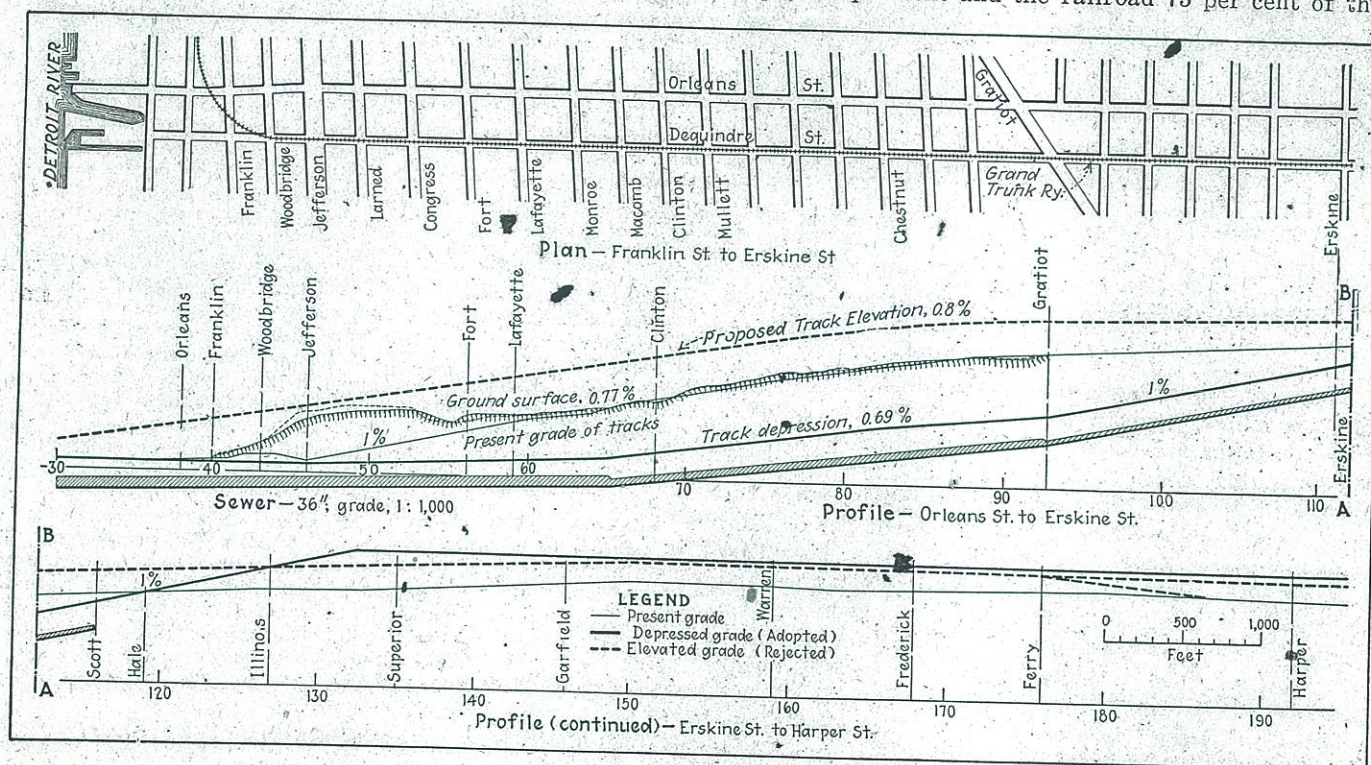


FIG. 1—TRACK DEPRESSION ON GRAND TRUNK RY. AT DETROIT

the subject of controversy and negotiation for several years, partly because the city desired track depression while the railway favored track elevation. An agreement, based on the city's project extending from a point south of Jefferson Ave. north to Hale St., was signed Jan. 16, 1923. Work was started last year and is now in progress on the second season's program. The general situation is shown in Fig. 1.

Elimination of grade crossings at Detroit has been in progress since the construction of the Woodward Ave. subway in 1901, with the result that the elevation of over forty-nine streets has been completed. In addition, fifteen streets are carried over the tracks; of four street viaducts over the Grand Trunk Ry., three are being replaced by structures of a different type. The Jefferson Ave. viaduct was built about 1891 in connection with the opening of East Grand Boulevard. Most of the viaducts were built before 1895 and were not connected with any general plan for grade separation.

Division of Expense—This Grand Trunk Ry. project is notable particularly for the fact that the 1923 contract was the first under an agreement in which the

cost. All damages to abutting property which are occasioned by the work and result in legal liability are to be assumed by the city. The general plan contemplates the restoration on the new grades of paving, curbing, sidewalks, sewers, water mains, public utilities, tracks, switches and signals substantially as at present. If changes are made by the city in restoring paving, or by the railroad in restoring tracks, any additional cost beyond that of the original facilities is to be borne by the party requiring the change.

The expense of removing and relaying tracks of the municipal street-car lines on five streets will be borne by the city's street railway department. Drainage of all intersecting streets and street bridges will be cared for by the city by the use of its sewers. All public utilities having wires, pipes or conduits across Dequindre St. are required to remove them during the progress of the work. All street bridges and approaches are to be paved with the material now used on the streets; the grading and construction work at bridges and embankments along the street approaches will also be included in the general cost.

Grade Separation Plans—In proceedings started by the city against the then Detroit, Grand Haven & Milwaukee Ry. (a branch of the Grand Trunk) for the separation of grades on the Dequindre St. line from Orleans St. north to Ferry Ave., the Michigan Public Utility Commission issued an order finding a public

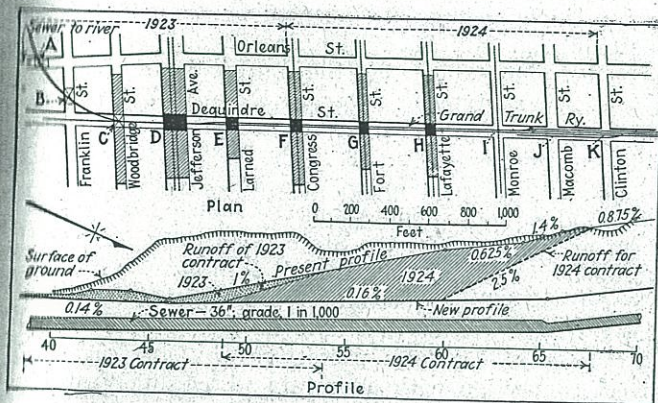


FIG. 2—LAYOUT OF GRADE SEPARATION WORK FOR 1923 AND 1924

A and B: grade crossings retained, but slightly changed. C: grade crossing depressed. D and E: new bridges and approaches, 1923. F, G and H: new bridges and approaches for 1924; street car lines abandoned temporarily. I: cut 10 ft. deep at end of 1924; street closed till end of 1925. J: street closed; cut 6 ft. deep at end of 1924; street to be reopened as temporary grade crossing during winter of 1924-25 and then again closed during work of 1925 season. K: Clinton St. not disturbed in 1924, grade of runoff track being made steep enough to avoid this street.

necessity for this grade separation and approving the city's plan for the depression of the tracks from Jefferson Ave. to Hale St., and for track elevation thence to Ferry Ave.

The company's 60-ft. right-of-way, which is to be preserved at full width, was adaptable for four tracks except between Jefferson and LaFayette Aves. At the Jefferson Ave. crossing the two existing tracks were gantleted, allowing for use of only one track at a time.

The first or 1923 contract covered the work at Woodbridge St., Jefferson Ave. and Larned St. (see Fig. 2). The 1924 program, started April 1, contemplates the continuation northward to include Congress, Fort and LaFayette Sts., which will be restored to use by the end of this year. Railroad traffic, averaging twelve passenger trains and twelve regular freight trains daily, will be handled on a single track that will be shifted within the right-of-way as the progress of the work requires. From Orleans St. there is a short descent at 0.14 per cent to Jefferson Ave., then ascending 0.16 per cent to Macomb St., 0.697 per cent to Chestnut St., 0.5 per cent to Gratiot Ave. and then 1 per cent to intersect the present grade at Hale St. and continue above it to Larned St., beyond which the line is level to the end of the work at Ferry Ave. The entire line is on tangent except for the turn into Dequindre St. at the south end.

With the rather heavy cut along the railroad and the consequent long approach on a grade commensurate with practical operating conditions, there will be two additional streets closed to traffic at some period in the course of operations and these will have to remain closed for a greater period than one construction season. The two streets affected this year are Monroe and Macomb Sts. In order to minimize disturbances to street traffic, by not closing Clinton St., the railway agreed to operate its temporary runoff from the new

elevation on a grade slightly steeper than 2.5 per cent (see Fig. 2). The closing of five adjacent streets for eight months and upwards will not occasion undue hardship, as the streets are of secondary importance and not arterial highways as was the case with Jefferson Ave. At most, a detour of three 220-ft. blocks will be necessary.

Temporary street-railway tracks will be constructed on other streets in the locality of the grade separation in progress. At the Jefferson Ave. crossing the street-railway tracks were carried on a temporary structure north of the old viaduct but within the street limits. Half of the street was closed to vehicular traffic during the construction operations and only one-way traffic was permitted, other traffic being detoured on streets one and two blocks north. Streets south of Jefferson Ave. will cross the railway tracks at the new elevation of rails, as shown in Fig. 2, and will have approach grades not exceeding 3 per cent. A 36-in. concrete pipe sewer will extend along the right-of-way from Hale St. to south of Jefferson Ave., where it will connect with an existing trunk sewer along Orleans St. to the river.

Street Bridges—There will be twenty-two bridges for consecutive streets over the 60-ft. right-of-way. Most of these structures will have two 30-ft. I-beam spans supported by abutments and a central bent. The Jefferson Ave. bridge, at the bottom of Fig. 3, is of this type. For the other bridges there will be single 60-ft. deck or half-through girder spans, with I-beam or plate-girder floorbeams and I-beam stringers supporting the concrete deck slab. Cantilever brackets will carry the sidewalk slabs. Where the headroom is

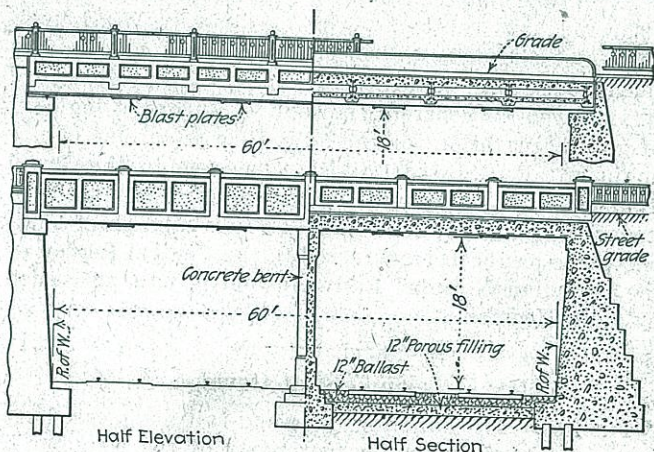


FIG. 3—TYPES OF BRIDGES OVER DEPRESSED TRACKS

insufficient for the deck girder arrangement, the floorbeams will be placed at the bottom chords and the tops of the girders will project above the curb line. All steel will be cased in concrete and blast plates will be placed over the tracks. Typical bridge construction is shown in Figs. 3 and 4, but the floors are modified where street-car tracks have to be accommodated.

Live-load is taken at 100 lb. per square foot for sidewalks and a concentration of 18-ton trucks for the roadways, with an impact allowance of 25 per cent in both cases. Each truck is assumed to have 10-ft. wheelbase with two-thirds of the load on the rear axle, and to occupy a space 25x9 ft. Where street-car tracks are carried, the design provides for a series of 50-ton cars 50x10 ft., with trucks spaced 30 ft. c. to c. and

a 5-ft. truck wheelbase. In this case, the impact allowance is 50 per cent. The depth from top of pavement to clearance line is 3 ft. with short spans and center bent; with single spans having half-through and deck girders, the depth is 4 and 6 ft. respectively.

Bridge abutments and retaining walls are of gravity type with plain concrete 1:2½:5 and a minimum of 1.3 barrels of cement per cubic yard. For the railings and

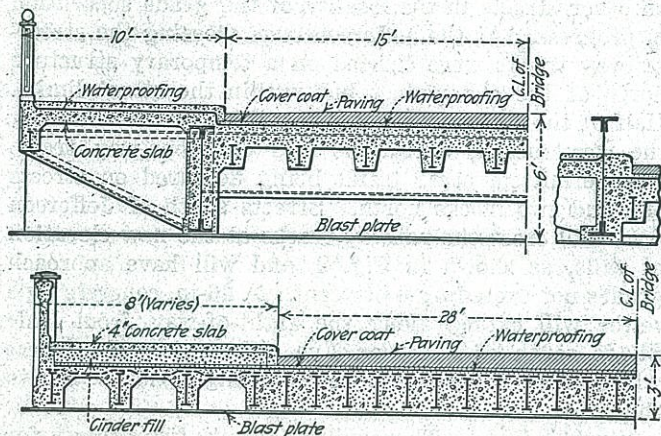


FIG. 4—FLOOR CONSTRUCTION OF BRIDGES
Above: plate-girder 60-ft. spans; half-through girder at right. Below: I-beam 30-ft. spans.

bottom four inches of decks the mix is 1:1½:3, with a minimum of two barrels of cement per cubic yard. The balance of the bridge decks, bents, sidewalks and all other reinforced-concrete parts are of 1:2:4 concrete, with a minimum of 1.6 barrels of cement per cubic yard.

Engineers and Contractors—All the work under the 1923 and 1924 contracts is being done by W. E. Lennane, Detroit. The unit prices of the first contract are continued, except that an addition of \$1.00 per cubic yard was allowed for concrete. Joseph L. Barton is engineer of grade separation for the city; George Jerome is city engineer. F. P. Sisson, division engineer of the Grand Trunk Ry., is in charge of the work, which has been under the general direction of T. T. Irving, chief engineer, who has been transferred to the Central Region of the Canadian National Railways and is now succeeded by J. A. Heaman.

Harbor Development at Oswego, N. Y.

Facilities for handling lake-and-rail business have been completed on the dock property of the New York, Ontario & Western Ry. at Oswego, N. Y., and arrangements made with the Rutland & Lake Michigan Transit Co. to provide adequate shipping service for lake ports. The railway company's annual report for 1923 states that this is one of the initial steps to make Oswego a real port, anticipating the enlargement of the harbor facilities, for which application is now pending before the U. S. Board of Engineers. The route from southern New England to Oswego by the New Haven road and the Ontario & Western is said to be more favorable than any other, so that a fair share of traffic can be developed on that route as well as from New York. For the improvement of Oswego harbor, effort is being made by the city authorities, aided by the rail and lake lines and also by the New York state officials interested in the barge canal terminating at Oswego and the extensive storage and other facilities provided there by the state.

Rules Prohibiting Cross-Connections in State of Washington

CCROSS-CONNECTIONS between public water-supply systems in the state of Washington and any other systems of water supply after Jan. 1, 1927, and prior to that date except under conditions noted below, are prohibited by regulations adopted by the State Board of Health on Jan. 14, 1924. The regulations seem to have been prompted by the outbreak of diarrhea, dysentery and typhoid fever at Everett, Wash., noted briefly on p. 59 of this issue, and commented on editorially in this issue, p. 46. The regulations require all cross-connections to be discontinued by April 15, 1924, unless both supplies and the connections between them are approved by the State Department of Health. Between the date named and Jan. 1, 1927, cross-connections will be permitted if protected by double check valves. After that date no public water supply may be used for "fire protection" by any means of direct connection with a private water-supply system.

The regulations in full are as follows:

WASHINGTON STATE DEPARTMENT OF HEALTH

Regulation Prohibiting Water Cross-Connections

Section 70 (k). For the purpose of this regulation, a cross-connection is a physical arrangement whereby a public water-supply system is connected with another water-supply system, either public or private, in such a manner that a flow of water into such public water-supply system from such other water-supply system is possible.

(l) For the purpose of this regulation, a bypass is a physical arrangement whereby water may be diverted around any feature of the purification process of a public water supply.

(m) For the purpose of this regulation, an emergency intake is an intake or other device capable of introducing water into the public water system from a source of supply which, because of its unsafe characteristics, has not been approved for drinking and culinary purposes by the State Department of Health.

(n) All cross-connections are hereafter prohibited within the limits of the State of Washington unless both water supplies are of safe sanitary quality, and both supplies and the connection thereof have received the approval of the State Department of Health. All persons, firms, or corporations now having or maintaining any cross-connections as defined in paragraph (k) of this section, whether or not such cross-connections are controlled by automatic devices such as check valves, or by hand-operated mechanisms, such as gate valves or stop cocks, which may or may not be sealed, shall, on or before April 15, 1924, discontinue and physically separate all such cross-connections, unless both supplies and the connection thereof have received the approval of the State Department of Health.

(o) Failure on the part of persons, firms, or corporations to discontinue the use of any and all cross-connections and to separate physically such cross-connections before April 15, 1924, will be sufficient cause for the discontinuance of the public water service to the premises on which the cross-connections exist, unless the quality of the water from the two supplies used has been approved by the State Department of Health. *Provided*, that, in the case of persons, firms, or corporations having installed before April 15, 1924, cross-connections consisting of two gate valves with indicator posts, two check valves of the factory mutual type with drip cocks and gages for testing, all to be placed in a vault of watertight construction accessible to ready inspection; the date of discontinuance of the same shall be extended until Jan. 1, 1927: *Provided further*, that such cross-connections are subjected to such inspections as the State Department of Health deems proper, the expense of such inspections to be borne by the person, firm, or corporation using such a cross-connection.

(p) After Jan. 1, 1927, public water supplies shall be made available for fire protection by the following methods only: (1) Construction of a pump well, or reservoir, to which the city mains are connected, pumps taking suction

Grand Trunk Relocates Its Line Through South Bend, Ind.

New Elevated Line Eliminates Street and Track Crossings—Six-Span River Bridge—Erection Methods

BY A combination of relocation and track elevation through the city of South Bend, Ind., the Grand Trunk Western Railway has eliminated all its fifteen street crossings at grade as well as a grade crossing of the tracks of the New York Central Lines, and has obtained access to a new union station. A somewhat spectacular feature in the construction of the new line was the erection of a six-span plate-girder bridge across the St. Joseph River, shown in Figs. 1 and 2.

South Bend's rapid development as an industrial center made the many existing grade crossings dangerous and inconvenient. The double-track main line of the New York Central traverses the city diagonally from northwest to southeast. The old single track of the Grand Trunk Western Railway, entering from the east, ran due west along Division St. and then turned southwest, crossing the New York Central Lines at grade. After extended negotiations, both railroads entered into separate contracts with the city in 1924, agreeing to elevate their tracks, to build about 25 street subways and to maintain separate stations. In 1928, however, an agreement was consummated between the city and the two railroad



FIG. 1—LAUNCHING GIRDER FOR RIVER SPAN
Rear end held and pushed by locomotive crane, as forward and is outhauled by galleys frame. Temporary towers form

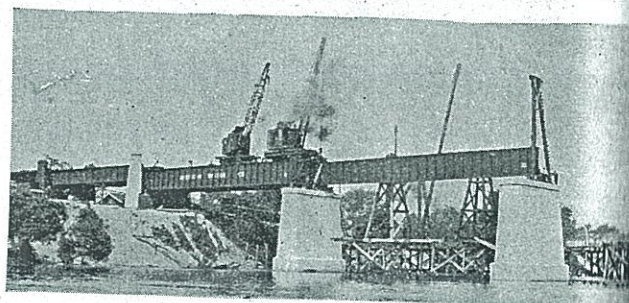
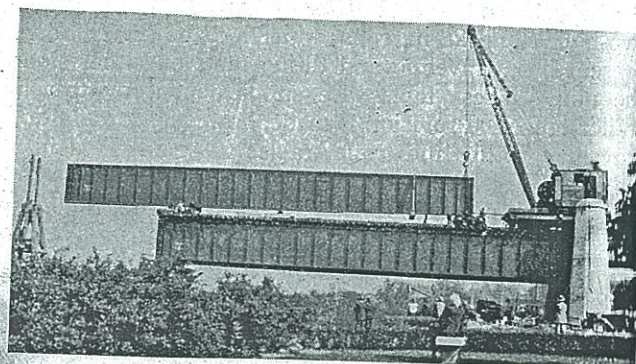


FIG. 2—ERECTING A GIRDER, ST. JOSEPH RIVER BRIDGE

Top—June 5, 4:20 p.m.; girder being pushed out on car trucks to first temporary tower. Middle—June 6, 10:40 a.m.; girder swung clear by crane and galleys frame and ready to be lowered when temporary tower is removed. Bottom—June 6, 10:50 a.m.; girder landed on its bearings.

companies whereby the route of the Grand Trunk Western was to be altered so as to enable it to join the New York Central and use jointly with the latter company $1\frac{1}{2}$ miles of its elevated line, as well as a new station to be constructed for the use of both railroads as a union station.

Under this agreement the Grand Trunk Western has constructed 1.3 miles of double-track railroad, with all grade crossings eliminated, to connect with the New York Central and will divert its traffic to the new line and station early in October. On the Central, the track elevation has a length of about $2\frac{1}{2}$ miles and consists mainly of an earthfill between concrete retaining walls, with steel bridges over the streets. The new union station occupies the site of the old New York Central station.

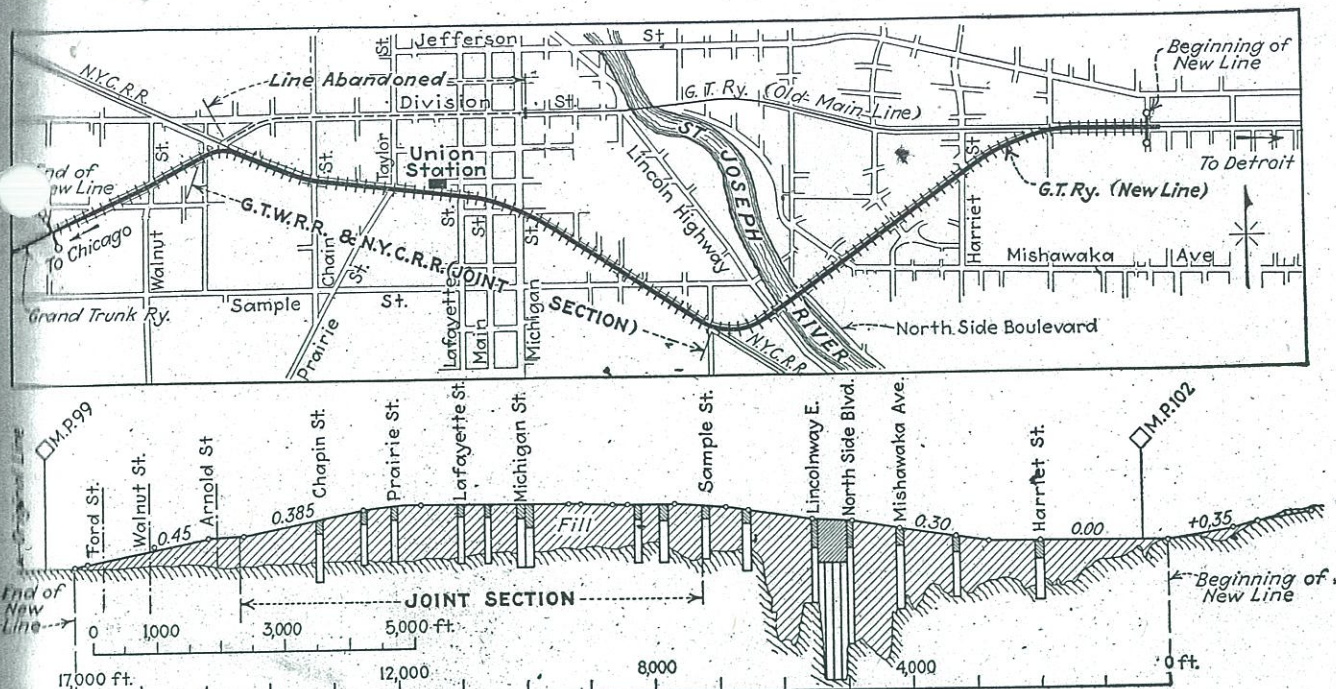


FIG. 3—RELOCATION OF GRAND TRUNK WESTERN RAILWAY AT SOUTH BEND, IND.

side of the St. Joseph River the Grand Trunk Western Railway had its own right-of-way, but that on crossing this river it entered Division St. and followed this thoroughfare to the western part of the city. As it had been proposed to extend the double-track through the city, the river bridge was completely rebuilt in 1910 as a double-track structure, but the second track was never laid across the river or through the city. Instead of this in accordance with the agreement noted above, the railroad has built a new double-track line 1.3 miles in length, crossing the river farther south by a six-span bridge and connecting with the elevated tracks of the New York Central. It has joint use of this line for about 1½ miles, including the union station, and then diverges to its original right-of-way, descending to ground level by a fill with a grade of 0.45 per cent. The east end of the old line will be retained as far as Michigan St. in order to serve the freight house, team tracks and a group of industries, but beyond that point the tracks will be removed, in order that Division St. may be fully developed as a main thoroughfare.

Two principal structures on the new line are the St. Joseph River bridge and a concrete arch spanning Mishawaka Ave. On the eastern end of the line are two subway bridges having spans of I-beams (parallel with the tracks) incased in concrete and supported on concrete abutments and intermediate reinforced-concrete bents. All bridges have concrete decks and ballasted tracks. As this end of the new line is in a residential and park district, the slopes of embankments are dressed and covered

with turf, thus giving a good appearance and preventing wash or erosion.

St. Joseph River Bridge—The new river crossing (Figs. 1, 2 and 4) consists of four 107-ft. plate-girder spans crossing the river channel and at each end a 90-ft. span, over the Lincoln Highway along the west bank and the North Side Boulevard along the east bank. These two shorter spans have the outer girders masked by a concrete fascia with decorative treatment and their piers are carried up as pylons to add to the architectural effect. In order to keep the grade line as low as practicable and still give the required headroom over the boulevards as well as to avoid girders of great depth, each span consists of four girders forming two single-track spans.

Substructure—The east bank was originally a swamp, covered gradually by 12 to 15 ft. of rubbish. Wooden piles were driven for the end pier and 50- and 60-ft. pre-cast concrete piles for a cellular concrete approach behind it (see Figs. 4 and 5). All other piers and the west approach have footings direct upon gravel, but permanent steel sheetpiling 20 ft. long surrounds and is anchored to the footings of the river piers, so that there can be no movement or scour of the material beneath them.

The west abutment or approach, where there is a high approach fill, is a rectangular cellular structure buried in the earthfill. To tie the walls together and also to reduce the weight of inclosed fill, a deck is provided at mid-height. A top slab forming the sub-grade is cantilevered out on either side to form a walk and is curved on the

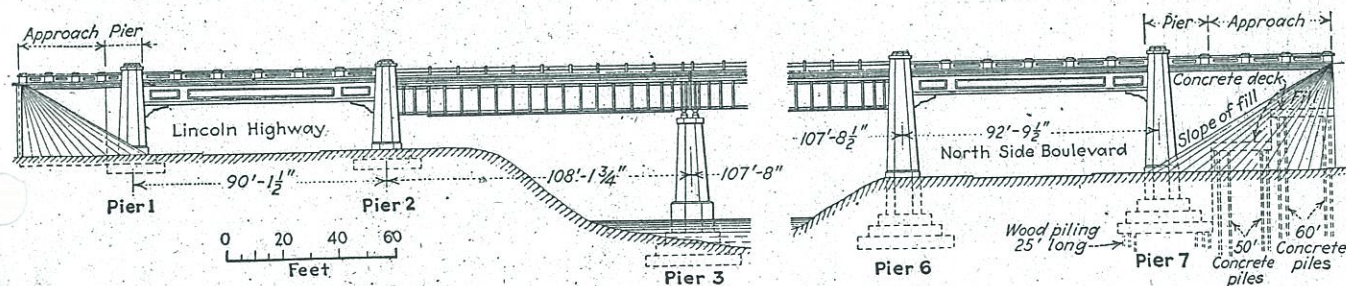


FIG. 4—ST. JOSEPH RIVER BRIDGE, GRAND TRUNK WESTERN RAILWAY

man on the pier then held the end of the girder for its movement to the pier. Each tower had on its top pair of well-greased horizontal iron rollers to support the girder and vertical guide rollers to hold it in line and prevent any lateral movement. To provide for this method of handling, the bottom chord of the girder was fitted with oak planking, notched for the cover plates and recessed for the rivet heads. This plank, having a minimum thickness of 2 in. and protected on the face by a steel plate, was bolted to the bottom flange.

For the next three spans, over the channel, the forward end of each girder was outhauled and supported by tackle from a gallows frame on the farther pier. The rear end was held by the boom of a locomotive crane on the track, and the crane pushed the girder out on its trucks, until it was supported by the two timber towers. When the girder reached the farther pier, it was held suspended from the crane and gallows frame and lowered into position on its bearing. Piles were driven to support the

temporary intermediate towers. In the bottom view (June 6, 10:50 a.m.), the girder has been landed on its bearings.

Concrete Arch Span—For the crossing of Mishawaka Ave., which has a double-track electric car line, a barrel arch bridge was adopted, having a clear span of 70 ft., with a headroom of 20 ft. at the center and 13½ ft. at the gutters of the 54-ft. roadway. The springing line is about 6 ft. above the sidewalk. As the crossing is at an angle of 71 deg., the actual span parallel with the railroad is 74 ft. At the site 10 to 15 ft. of gravel is underlain by 15 to 18 ft. of stiff clay. The abutments are of cellular construction, with creosoted wood pile foundations and sand filling to subgrade. A double layer of scrap rail is placed over the piles and similar rail is used also in the abutments, as shown in Fig. 8. Views of the construction of the bridge are given in Fig. 9.

The arch barrel has a radial thickness of 4 ft. 6 in. at the haunches and 2 ft. 6 in. at the crown. Grooves at

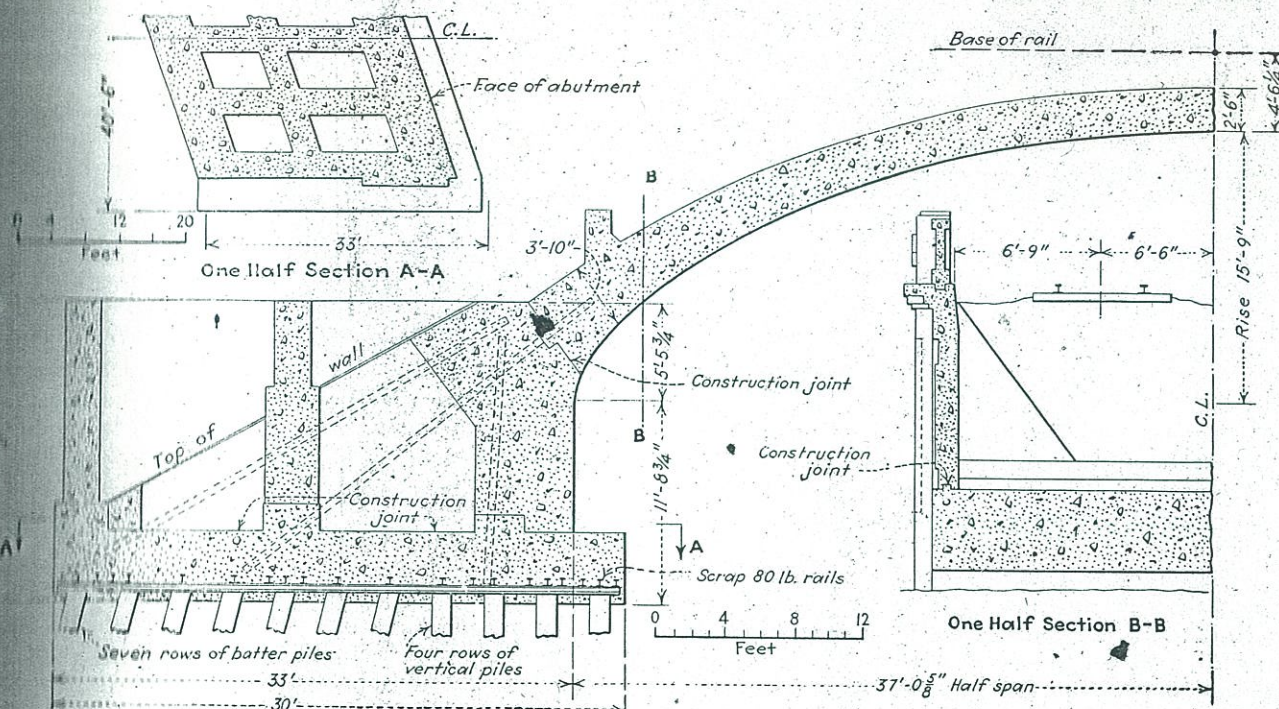


FIG. 8—ARCH SPAN OVER MISHAWAKA AVE.

temporary timber towers in the river spans. These towers were not dismantled, but were picked up and carried from one span to the next by a derrick traveling on a low construction trestle on the downstream side of the bridge. When one span for the westbound track had been erected and field riveting completed, the girders for the eastbound track were brought ahead and placed in position by the same methods.

These erection methods are explained by the illustrations Fig. 1 and 2, which show the work on span No. 3, of the second river span. In Fig. 1 (June 5, 1929, 4:30 p.m.), the first girder has been run out as far as the first tower. At the left is the gallows frame on the farther pier, the tackle of which is operated from a hoisting engine on the farther or eastern bank. In the top view of Fig. 2 (June 5, 4:20 p.m.), this first girder is being pushed out by the locomotive crane, the girder riding on the car trucks. In the middle view (June 6, 10:40 a.m.), the girder has been swung clear, being held by the locomotive crane and the gallows frame, while a derrick traveling on the construction trestle is removing one of

each side form mortise joints for the spandrel walls, the tops of which have similar joints for the parapet. Gussets or counterforts extend from these walls to the surface of the arch. The barrel of the arch is waterproofed with a membrane of fabric with asphalt mopping, and upon this is a protective coat of asphalt block covered with a 6-in. bed of broken stone for drainage of the slag fill. Iron drainpipes are also laid in this stone layer. The spandrel walls and parapets are relieved by recessed and bush-hammered panels. For concrete finish, the exposed surfaces received the same treatment as the river substructure. To retain the slopes of the approach fills and prevent material from sliding over onto the sidewalks, there are circular curb or toe walls, 8 in. thick. These are 5½ ft. deep and project 2 ft. above the ground line, similar to those at the fills of the river bridge, shown in Fig. 7.

In the construction of this bridge, the concrete of the abutments was placed by spouting from a bucket in a hoisting tower. For the arch itself and the spandrel walls, a narrow-gage track was laid along the falsework,

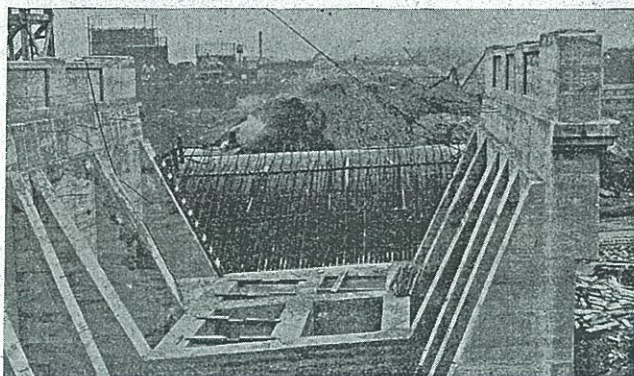


FIG. 9—CONSTRUCTION OF ARCH BRIDGE
Above—East abutment and first section of arch. Below—
cellular abutment, with reinforcing steel placed for 70-ft.
arch.

on the side adjacent to the tower, and on this ran two steel bottom-discharge hopper cars, pushed by hand. They were loaded from the hoisting bucket and dumped the concrete into portable chutes leading to different parts of the form, as required. The street-car tracks were gantleted by means of temporary portable turnouts, the permanent tracks and street paving being laid after the bridge was completed.

Engineers and Contractors—Both design and construction of the new line and its structures were under the direction of J. A. Heaman, chief engineer; F. P. Sisson, principal assistant engineer, and A. N. Laird, bridge engineer, of the Grand Trunk Western Railway, with W. G. Heggie in charge of the field organization. The grading was handled by Whitman & Keller, South Bend, Ind., and the Walsh Construction Company, Davenport, Iowa; the concreting and steel erection for the river bridge and the Mishawaka Ave. arch was done by Foley Bros. and Fulton & Peppard, St. Paul, Minn. Concrete finishing and surface waterproofing was done by the Wertz Company, Cleveland, Ohio. Two subways were built complete by the Mead-Balch Construction Company, Indianapolis, Ind. All superstructure steel was fabricated and furnished by the American Bridge Company. The total cost of this Grand Trunk Western Railway project was about \$1,800,000. Of this cost, the city paid \$671,000, a portion of this sum being contributed by the city in consideration of the Grand Trunk Western relinquishing its rights in Division St. and joining with the New York Central for its line through the city, thus eliminating the situation of two railroads traversing the city with a multiplicity of grade separation structures, while also providing the additional advantage of a union station. In addition to the above, the city paid 25 per cent of the cost of work at street crossings where grades

Chemical Treatment of Hydraulic Dam Cores

Physical Chemist and Engineer Develop an Application of a Colloidal Phenomenon of Clays

By F. E. HANCE
Honolulu, Hawaii

RESEARCHES in Honolulu on soil materials available for dam construction have brought out an important practical possibility of utilizing colloid phenomena known to the physical chemist. Some specific results shown by these studies are:

1. Surface deposits of many mountain soils are highly acid in reaction, and when classified according to the scheme of Dr. Charles Terzaghi they fall within the limits of sandy loams or silts.

2. When agitated with water many of these soils fail to impart their acidity to the water, and a condition of semi-permanent dispersion of soil in water is frequently obtained.

3. An acid soil which will produce a dispersed semi-permanent cloudy mixture with water will, upon neutralization with alkali, immediately flocculate and settle out, forming a well-defined and granular deposit under the clear water remaining above it. Under the Terzaghi tests the precipitated and neutralized soils resulting from this treatment are classified now as sandy silts and are much more permeable, more granular and also carry a greater percentage of voids than the same material in its natural acid condition as first described.

4. When treated with enough alkali to produce a soil reaction of about 10 on the pH scale (15 to 35 lb. Na_2O per ton of soil), the precipitated neutral soil described in the preceding paragraph is altered by the treatment so that it falls within the classification of the fat clays. In addition this alkaline-treated soil has become from 200 to 1,000 per cent more impermeable than the same material when neutral. The voids have been reduced to a remarkable extent, and the physical appearance is suggestive of a very sticky and heavy clay.

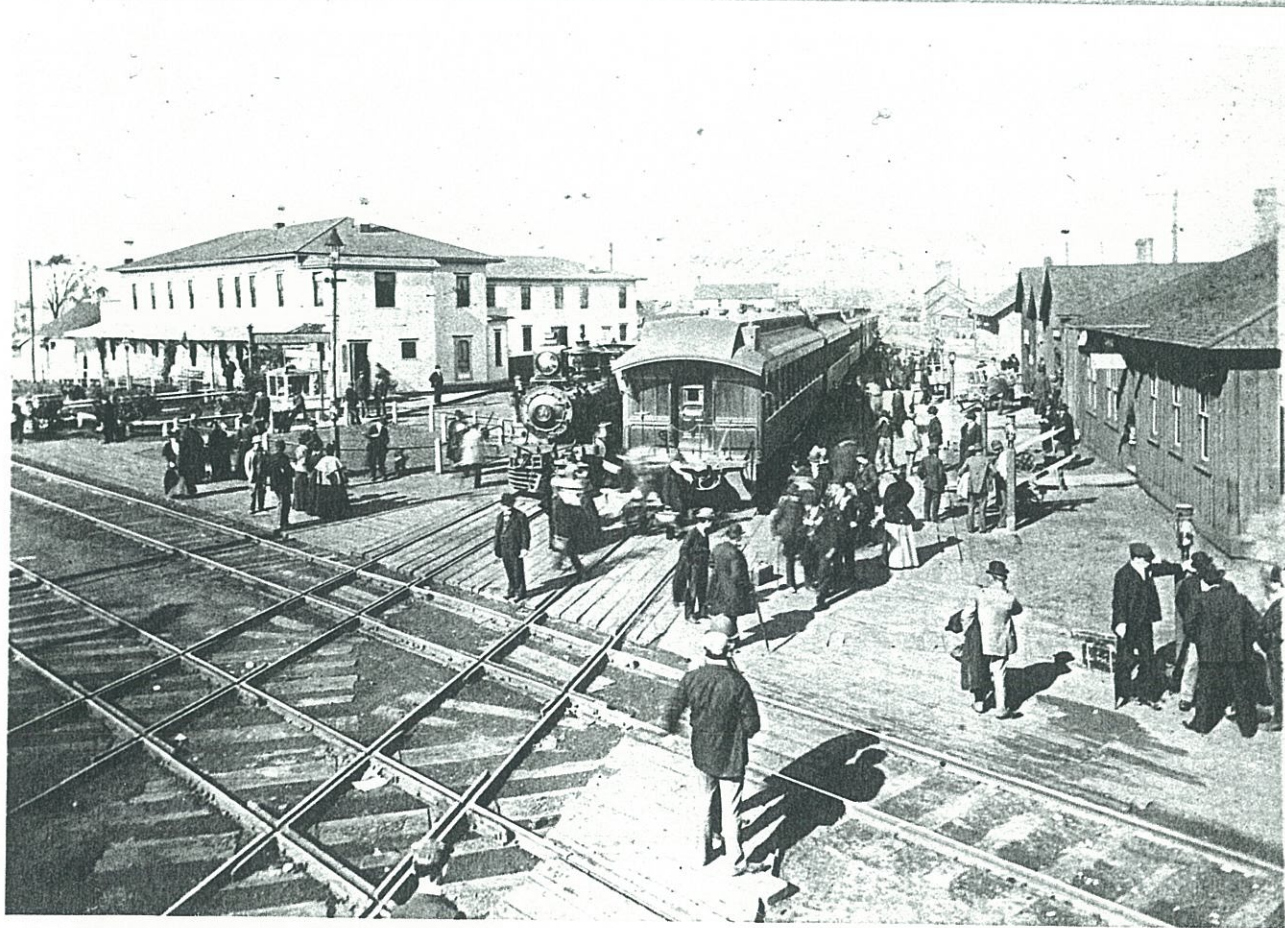
The relatively small amount of alkali (soda ash) required to produce this effect on the colloidal structure of the soil, affecting to such a marked extent its permeability and reduction in voids, has led the writer to propose:

(a) That further research be encouraged with systematic studies on the physical and chemical properties of soils in relation to its usefulness to the engineer in foundation problems and in special problems of core trenches in dams.

(b) That a field of usefulness to the engineer may be developed from other physical chemical tests and consequent predictions as to consolidation, stability, etc., now in vogue in this laboratory.

(c) That the free-flowing and highly impermeable yet readily consolidated alkali-treated soil be employed as a fill in a wedge-shaped trench immediately surrounding a concrete cutoff wall, the latter carried down to bedrock through a stratum of gravel beneath the foundation of a dam.

Practical application of the alkali treatment is now being made in actual construction of the dam in question. Further details will not be available until later.



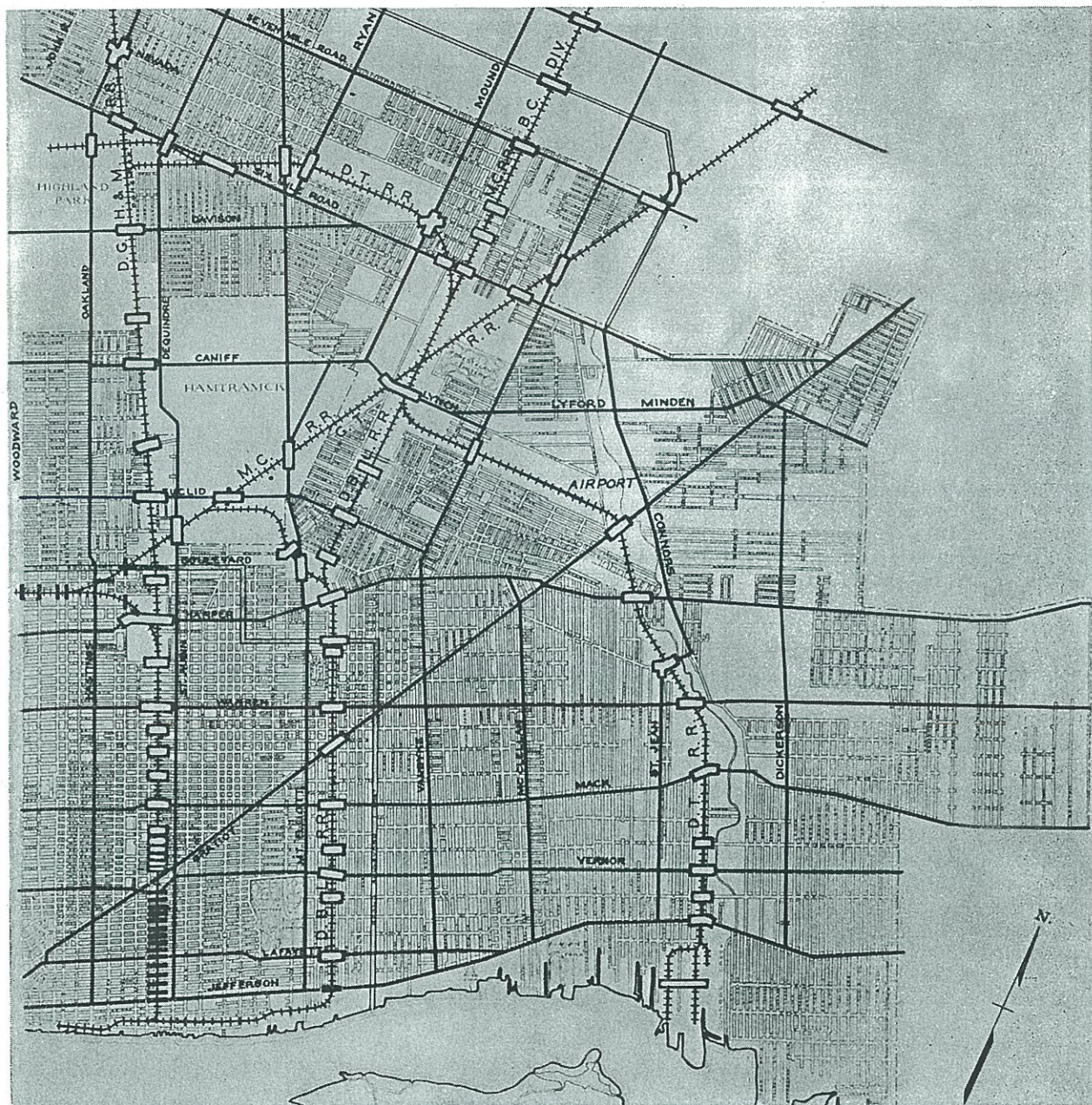
15.3 per mile and on another part 6 per mile or a weighted average of 13 per mile.

In its first report, the engineering committee contended for a complete reversal of this policy, stating that the great increase in volume of traffic all over the city required a plan that will put the main-traveled arteries and proposed new major thoroughfares at regular intervals first on the list for the elimination of grade crossings. This can be done only following the design of the general thoroughfare plan and setting up a

the fire department, to consider the requirements of the industries from the standpoint of present operations, plant expansion, and street and industrial track service, and to effect the maximum economy in the entire grade separation plan.

Header Streets

One feature to which the committee has given particular attention is the local revision of street systems through the agency of header streets paralleling the rail-



General Grade Separation Plan for the Area East of Woodward Avenue, Detroit, Mich.—Note the Close Spacing of the Completed Separations (Shown in Solid Bars) Compared with the Wider Spacing Advocated for the Work Still to be Done (Indicated by the Rectangles)

definite program within the financial resources of the city and the railroads.

Its studies of individual projects, of which 70 have been investigated to date, have been conducted with a view to the meeting of certain fundamental ideas, namely to conform to the requirements of the master plan of the city for through traffic highways, to provide necessary access to parks and schools and meet the needs of

way right-of-way, whereby all streets scheduled to be stub-ended by the plan for limiting the number of grade separations will be afforded convenient and adequate access to the nearest streets for which grade separated crossings are to be provided. An important element of this plan is to locate the header streets far enough away from the right-of-way lines to provide adequate room for unhampered industrial expansion.

While, as stated above, the work of the committee has no official status, each project considered is studied in sufficient detail to permit of tentative agreement on all the essential elements. This was set forth in the committee's first report as follows:

"Your committee has therefore sought (1) to define the position and number of grade separations regardless of the period at which they may be constructed; (2) to determine the permanent profile of the railroads; (3) to determine the character of structure at each point of separation of grades; (4) to outline a program of construction that will give preference to the thoroughfares that will most greatly facilitate the free movement of traffic."

Less Crossings Required

One of the most important results of these studies lies in the potential reduction in the cost of the work when it is eventually carried out. Instead of a possible 199 separations that might be demanded in the absence of an improved plan, there are now contemplated but 73 or 2.2 per mile, in contrast to the 32 that were already massed in less than three miles of line.

A further insight into the work of this organization and into some of the policies that have governed its deliberations is afforded by the following abstract from an article by J. P. Hallihan, chief engineer, Detroit Rapid Transit Commission, which comprised a part of the report of the Committee on Grade Crossings of the A.R.E.A. that was presented at the convention on March 15.

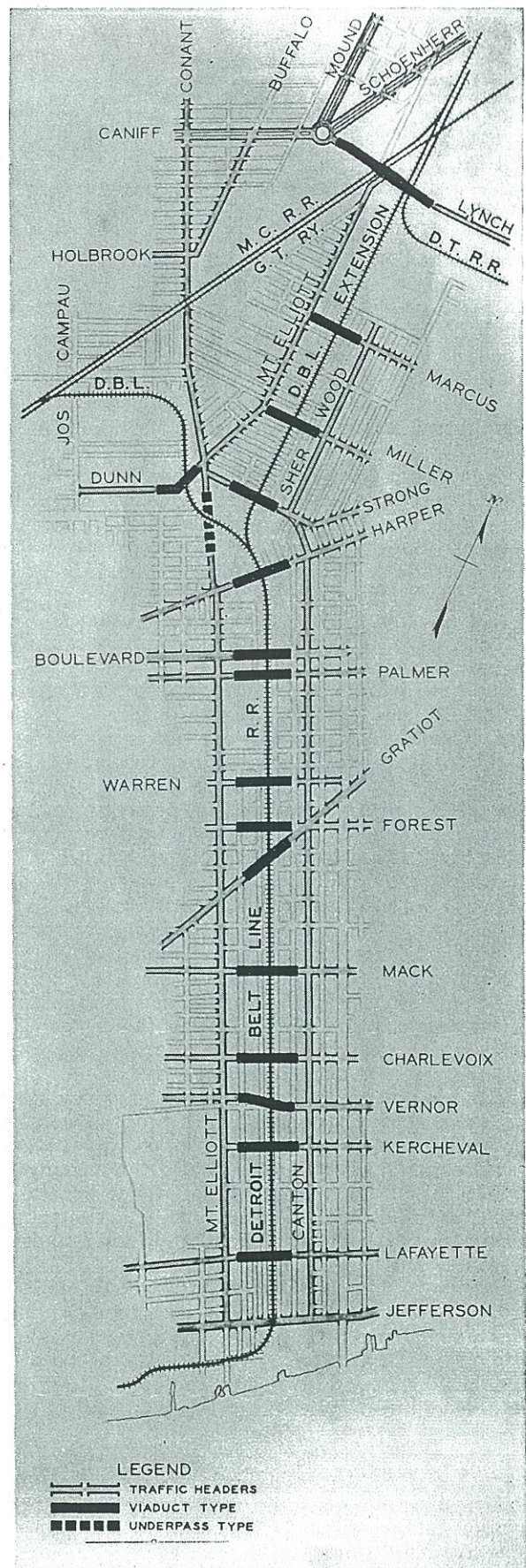
"The work of the committee is regarded as an important forward step in regional planning. It is the first time in any city, so far as known, that all the various public and private interests concerned in the problem of elimination of grade crossings have been brought together to find the best solution from a non-partisan, common-sense, economic viewpoint.

"The result has proved the value of the participation of the railroads in civic matters. Controversial questions that had long been the subject of discussion between railroad and railroad, and between city and railroad, were speedily and amicably settled with the help of industry, the third and most important party in interest, highly qualified to act as a balancing factor.

"Incidentally, the committee declined to consider the question of division of costs between the city and the railroads, but three of its members invited by the common council to sit on a special city committee to determine that question with an individual road, defined the elements that should enter into the accounting, for whatever division of the total might be agreed upon between the parties interested in the light of other conditions. There is no effort to accelerate the construction program, though it is recommended that preference be given the major thoroughfares serving industrial traffic.

Indecision and Waste Eliminated

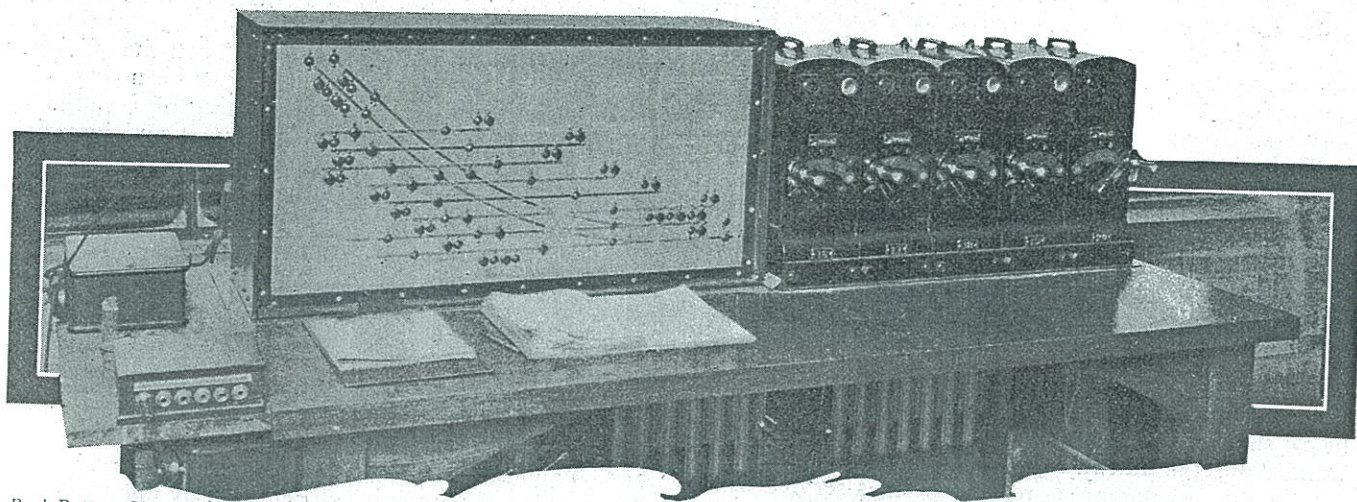
"The net result of the work of the committee is to eliminate a condition of uncertainty, indecision, impermanence and waste. In lieu of this it offers a definite workable plan in line with modern requirements, to be accomplished as needs dictate and circumstances permit. Perhaps the most important immediate benefit is derived by the cities and the railroads who are now in position to assure new industries seeking locations, of the exact position of the track profile, of projected thoroughfare openings, or probable land takings, and of the elimination of unwarranted local street intrusions into industrial territory."



A Typical Unit Project as Developed According to the Detroit Plan—Spacing of Street Over or Under Crossings Is Sufficient to Allow Effective Industrial Development—Note that Header Streets are Set Back Two Blocks From the Railroad

Michigan Central Installs Simplified Electric Interlocker

Push-button control for signals, and desk levers for power switches effect economy in new plant at Detroit



Push-Button Signal Control Diagram and Table-Lever Controllers for Power Switch Machines

An innovation in the electric control of interlocked color-light signals and power switches is found in a new electric plant recently completed by the Michigan Central at Belt Line Junction, Detroit, Mich., to replace a mechanical interlocker. The most noteworthy feature of the new plant is a combination push-button signal control machine and track diagram, whereby the color-light signals are controlled by means of push-buttons located on this diagram to correspond with the respective locations of the signals in the plant. Adjoining this control panel is a five-lever G-R-S table interlocker for controlling six power-operated switch machines and for the selection of traffic as between the Michigan Central and the Grand Trunk Western, the other road involved in the plant.

A feature of the plant is the absence of derails. The high signals, of which there are three, are triangular type color-light signals, employing 18-watt, 10-volt lamps. The dwarf signals are the searchlight type, using two indications (red and yellow) except for the two Grand Trunk Western main-line tracks, where the signal aspects displayed are red and green. The power switch machines, the color-light signals, desk-lever units, and other related equipment were furnished by the General Railway Signal Company.

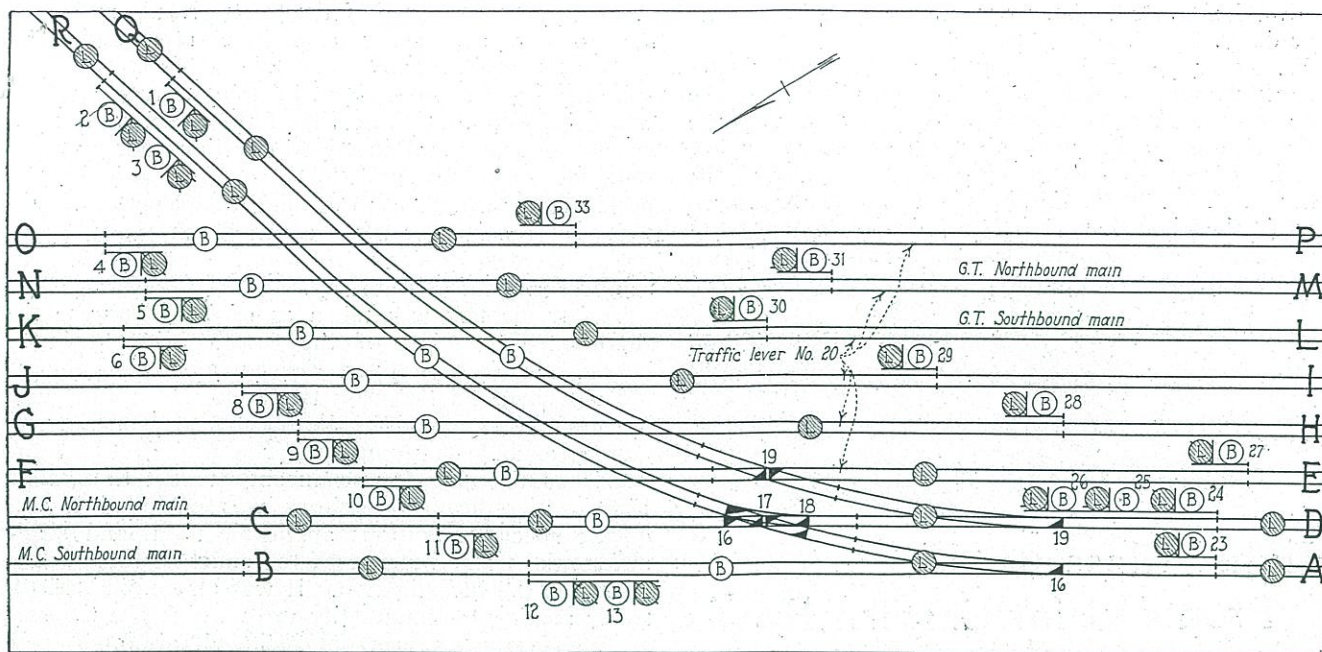
The plant handles the Michigan Central freight trains for the Belt Line, which serves most of the industries at Detroit, and also the Michigan Central's passenger and freight traffic between Detroit and Bay City. The Grand Trunk Western has six tracks in this plant, all of which are crossed by the double-track Belt Line connection. However, no interchange movements between the two roads are made at this plant.

Signal Control Diagram and Table Levers

A three-story brick and concrete building has been provided for the control facilities as well as for a branch

yard office and switchman's headquarters. The top floor is used jointly by the yardmaster and the towerman. The signal control panel, the five table-lever controllers and the relay racks for all of the control relays in the tower, are located in this room. The push-button control machine for the signals resembles the illuminated track diagram commonly used at interlocking plants. However, in addition to the usual indicating lamps, a number of Western Electric push buttons are mounted on this panel. Reference to the track and signal drawing will show that a push button is mounted adjacent to a red switchboard lamp to represent each of the dwarf and high signals in the plant. In addition, track circuit repeating lamps are placed near the center of each track section. There is also a push button in each track section for the purpose of changing a route in the event that it is found necessary to do so before the signal is accepted by a train. The red signal lamps are normally lighted, because the red signal unit is the one normally operated. The track circuit repeating lamps, however, are lighted only when a train enters the track section.

The five-lever G-R-S table interlocker is mounted on the same table as the signal control panel. The four units controlling the six power switches are provided with high-voltage "snap" contacts for the 110-volt motor circuits. Each unit is provided with normal and reverse indicating positions. There is also an electric route lock on each switch machine lever. A red indicating lamp in the upper left corner of each unit informs the leverman when the switch machine has unlocked and is being operated to the reverse position, this lamp being energized only during the operating cycle. The fifth table-lever unit, the one at the extreme right, is a traffic control lever for interlocking the control of train movements northbound and southbound on the six Grand Trunk Western tracks with the diverging Belt Line train movements of the Michigan Central. The five table-lever



Track and Signaling Plan of Belt Line Junction Interlocker, Detroit, Mich.

units are mounted on a common mechanical locking bed; thus the usual preliminary mechanical interlocking features found in all plants are provided in this case.

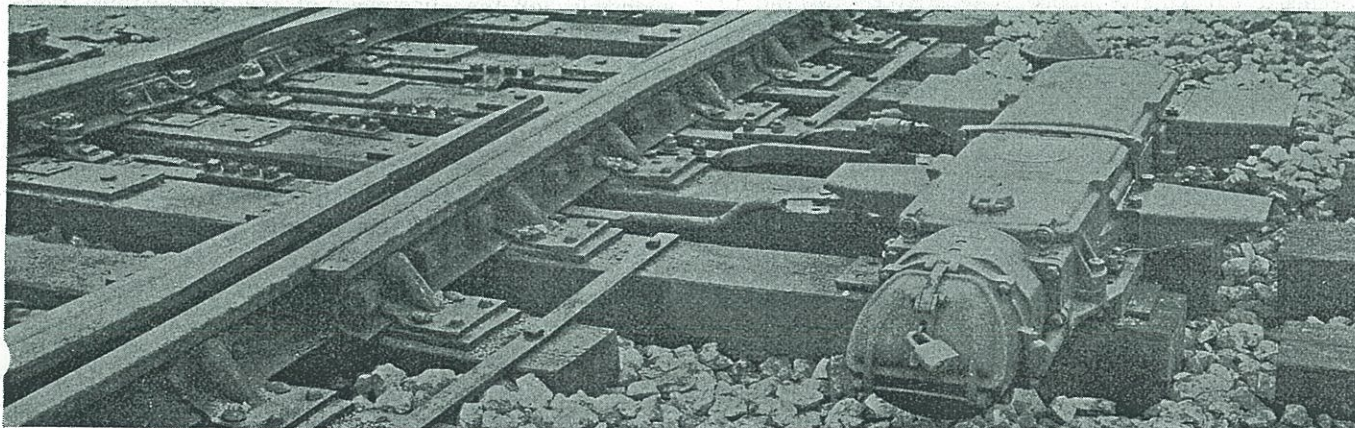
Power Supply Facilities

The power supply facilities are located in the basement of the tower. A 55-cell Exide Ironclad storage battery furnishes energy for the operation of the 110-volt power switch machines. Union electronic rectifiers for charging these batteries are also located in this room. Owing to the use of a sealed jar storage battery, no acid spray or destructive corrosion is experienced and hence the charging equipment is located in the battery room with an attendant saving in space.

An example of the mechanical interlocking will be given. For instance, traffic lever 20, when moved to the right, will permit northbound and southbound movements on the G. T. W. tracks. On the other hand, when lever 20 is moved to the left it is possible to reverse switches 18 and 19 for a diverging movement over the Belt Line. In other words, when traffic lever 20 is in the extreme right position, the Michigan Central switches 18 and 19 are locked in their normal position by traffic lever 20; also when lever 20 is in the extreme left posi-

tion, the reversal of switches 18 and 19 locks traffic lever 20 in the extreme left position.

Assuming that traffic lever 20 is in the extreme right position, the northbound dwarf signal 31 on the Grand Trunk Western main line can be cleared by pushing button 31. At the same time, it is also possible, for instance, to clear high signal 26 on the Michigan Central for a through movement on that line. Operation of the button extinguishes the red indicating lamp, thus informing the leverman that the red signal has changed to green. If the leverman should desire to change the lineup, he would push the button in the center of the track section in advance of signal 31 and this would immediately restore the red signal at dwarf signal 31. This operation would also initiate the operation of a time-element relay (with a time setting of one minute) which, at the conclusion of its operation, would permit the leverman to move traffic lever 20 to the left, preparatory to lining up the switches and signals for a Belt Line movement. If the leverman should inadvertently push the dwarf signal button for the reverse direction; in other words, if he should push button 5 instead of button 31 on the G. T. W., he could immediately rectify his error by pushing button 31, for the last mentioned operation would restore signal 5 to stop and light the green signal



One of the Power Switch Machines Controlled from a Desk-Lever Unit in the Tower

at dwarf signal 31. This operation would involve no time delay.

Whenever the route is changed by pushing the signal-restoring button in the center of the track circuit, the time-element relay is caused to operate, but only the signal on the particular track involved is changed to red, that is, any non-conflicting green signal on any of the other G. T. W. or M. C. tracks will remain green, even though the time-element relay starts to operate. A multiple connection of push-button contacts on the signal control panel prevents the changing of a green signal to red on any of the non-conflicting routes.

Although this electric plant is the simplest of any on the M. C., it is the most complete from the standpoint of electric locking protection. The interlocking of the electrical control is effected by means of two "master" relays.

Higher Class Rates Proposed for Eastern Roads

WASHINGTON, D. C.
THE "other side" of the Hoch-Smith resolution, which heretofore has been discussed principally from the standpoint of the rates to be reduced under it, began to show some signs of life at a hearing before Commissioner Eastman and Attorney-Examiner Howard Hosmer of the Interstate Commerce Commission on April 12 in connection with the commission's Eastern Class Rate Investigation.

The hearing was held for the purpose of receiving in evidence the results of a traffic test conducted by the railroads to show the effect of the proposed revision of class rates in Official Classification territory recommended by Mr. Hosmer in his proposed report in the case, made public on April 16, 1928. The testimony presented indicated that the proposed rates might produce an increase of approximately 10 per cent in revenues from class traffic, or about \$43,000,000 a year, when applied to the traffic of the year 1925.

The investigation has been under way since 1924, having been instituted by the commission on a joint petition of the railroads and shippers after the commission had indicated that no more fourth section relief should be granted as to the eastern class rates. The proposed report issued last year, while stating that the investigation had been handled from the standpoint of a revision rather than from the revenue standpoint, suggested that class-rate traffic in official territory "seems a particularly appropriate source" for the recoupment in revenue to be necessitated by the not improbable reductions in certain other rates as a result of the Hoch-Smith resolution.

The Hosmer report proposed a general revision of the class rates in official territory, based on a distance scale of maximum rates for basic use and 23 classes having a percentage relation to the first-class rates. It followed extensive hearings which produced 11,849 pages of testimony and 1,002 exhibits. To ascertain the extent of the increase in revenues which might result from the revision the report proposed the traffic test, which was undertaken by the railroads by applying the proposed scales to the actual waybills on class traffic for 12 days in 1925 selected by representatives of the railroads, the shippers and the commission, and under conditions which they had agreed upon.

The results of the traffic study were presented by F.

J. Fell, Jr., comptroller of the Pennsylvania and chairman of an accounting committee representing the carriers, in the form of a voluminous exhibit, and his testimony was supplemented by that of traffic officers who explained various details of the effect of the proposed rate scales and answered questions put by representatives of the shippers. The commission is now expected to set a date for the filing of exceptions to the proposed report and for oral argument on it, so the proposed rates have yet to run the gauntlet of the shippers and the commission.

The traffic test was taken as of 1925 because that represented the time of the data considered at the hearings in the case. Mr. Fell explained that the test did not cover all the class traffic of the territory and other witnesses explained the reasons why certain traffic was excluded or omitted. The New York Central furnished the data for an incomplete list of stations. Illinois Classification territory was excluded because of the special conditions applicable to it, and all-rail differential traffic because of the effect of rates not involved in the investigation. It was also explained that traffic moving on commodity rates which are the same as the class rates was not included, although traffic moving on exceptions to the classification which apply a percentage of the class rates was included.

Wilbur La Roe, Jr., representing New York state shippers, expressed a "guess" that the excluded traffic might increase the total possible increase in revenues to \$60,000,000 a year and asked, in view of the importance of the probable effect on revenues, that the railroads stipulate that their revenue reports for 1928 be made a part of the record for the purpose of argument.

R. W. Barrett, vice-president and general counsel of the Lehigh Valley, who appeared as counsel for the eastern roads, said they would object to such a stipulation because if the revenues for 1928 were to be considered the roads would desire to offer some testimony in explanation.

In the proposed report Attorney-Examiner Hosmer said in part: "The new system of class rates should clearly not yield less than the present aggregate revenues. On the contrary there is ground for the view that class-rate traffic in this territory, particularly that belonging to the higher classes, might well pay higher rates than those now in effect. This view is held by many authorities on transportation economics, who believe that freight charges are of far less relative importance in the case of high-grade, manufactured commodities than they are in that of low-grade, raw materials, and it seems to have been at least in part responsible for the enactment of the Hoch-Smith resolution. It is not improbable that under this resolution and the proceedings in No. 17,000 reductions in certain rates may be ordered which will necessitate some recoupment in revenue from other forms of traffic, and class-rate traffic in official territory seems a particularly appropriate source for reasons which will be stated. The approximate extent of the increase will be shown by the traffic test, and this information will be of great value in the final determination of the proceeding."

THE CANADIAN PACIFIC now has under construction in Ontario, Manitoba, Alberta, Saskatchewan and British Columbia 100 sets of cottages, barns and other outbuildings for the use of British settlers, to whom the buildings will be leased for a twelve-month period. Each set of buildings is located on an acre of ground adjoining a large farm. About 40 of the units will have been completed by April 30.

eld from the despatcher. The conductor was busy collecting tickets and the meeting order dropped out of his mind until he reached the station. While passing he imagined he saw two eastbound passenger trains in the side track, though in fact there was only one such train there. The operator who gave the clear flag signal had been stationed at that point temporarily for the purpose of block-signaling trains running in the same direction, without regard to despatcher's orders concerning the movement of trains running toward each other.

Collisions, 4, 6, 8, 9, 10, 16 and 22 were due to mistakes or forgetfulness in connection with telegraphic orders or in reading time-tables. In collision No. 3 the men at fault had been on duty 18 hours.

Railroad Law.

The following abstracts are taken from recent decisions of the Supreme Court and the Federal Circuit Courts in railroad cases:

Connecting Carriers.—A special contract by a railroad company to transport a through shipment by a vessel of a connecting carrier sailing on a designated day will be deduced from the acceptance of a through rate for shipment "to be forwarded" via such steamer, which rate was quoted with notice that it was of vital importance that the shipment should be transported promptly to enable the shipper to fulfill a contract for the sale of the goods at destination which re-

ity and he is specially fitted for the position by reason of his familiarity with the property and its operation the appointment will not be refused because of his relationship to certain of the large stockholders and bondholders nor because he had been an officer and director of the company. (U. S. Cir. Ct. Va.) *Bowling Green Trust Co. vs. Virginia Passenger & Power Co.*, 133 Fed. Rep. 186.

Telegraph Company's Entry on Railroad Right of Way.—Telegraph companies were not granted a right to enter upon and occupy railroad rights of way without consent by acts of Congress giving telegraph companies the right to construct, maintain and operate telegraph lines through and over the public domains and "over and along any of the military or post roads of the United States"; the purpose of that act being to withdraw interstate commerce by telegraph from state interference. (Sup. Ct. U. S.) *Western Union Telegraph Co. vs. Pennsylvania R. R. Co.*, 25 Sup. Ct., Rep. 183.

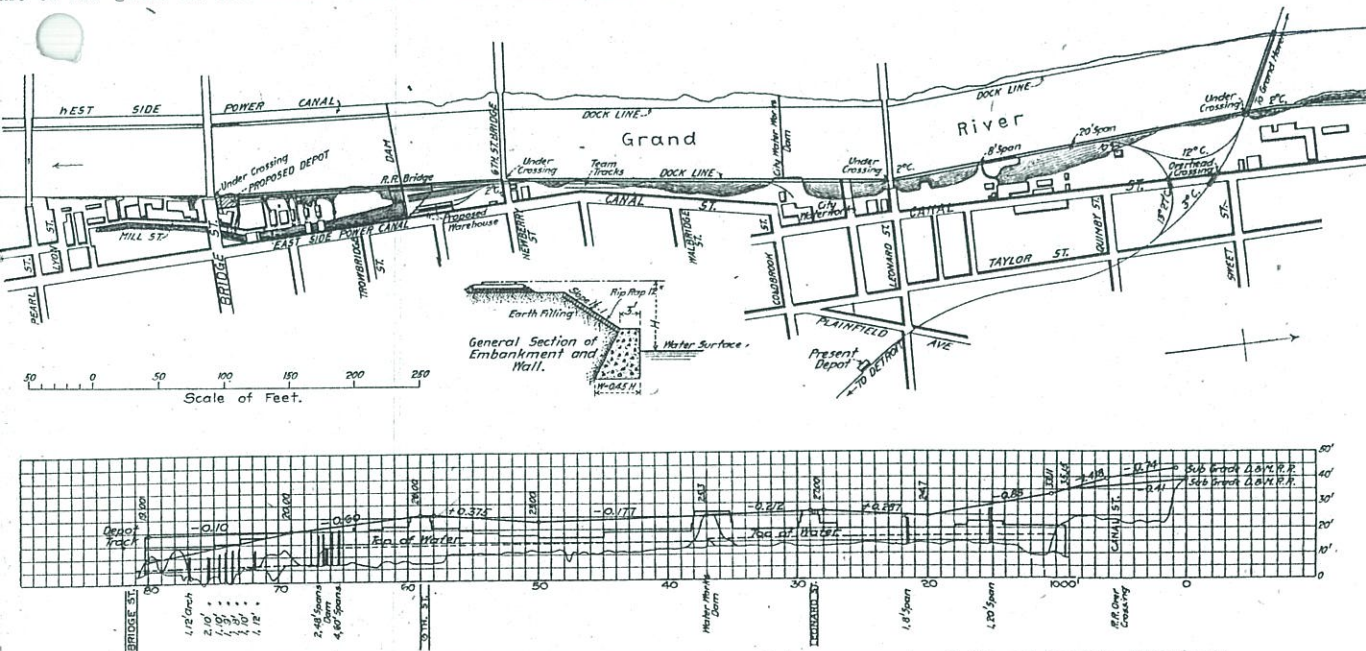
Grand Trunk Terminal Improvements at Grand Rapids.

The present passenger and freight station of the Detroit, Grand Haven & Milwaukee Railway at Grand Rapids, Mich., being about 1 3/4 miles from the center of the manufacturing and business district of the city, it was decided last July that the line should

where, on the score of economy, it is but a few feet above the ordinary stage of water in the river. The height of this protection wall thus varies from about 7 ft. to 20 ft. After the completion of the embankment it is to be further protected to high-water mark by hand-placed riprap, as shown on the sketch of the general section of embankment and wall.

Bridge and Canal streets are the most important in the city. At the former the city has recently completed a concrete arch bridge about 500 ft. long. In order to pass under the approach to this structure, the track extending below Bridge street has to be depressed considerably. The elevation of the roadway at Bridge street is 28 ft.; the floor of the passenger station will be at about that same elevation, while the station tracks will be 21 ft. The elevation of the depressed track under Bridge street will be 10 1/2 ft. at that point. It will therefore be necessary for the Terminal Company to build in addition to the dock line wall, another wall supporting the filling for the station tracks, which will lie above the depressed track for about 1,000 ft.; also another wall protecting the property to the east and north of the company's property, on account of the limited space that could be acquired for track purposes.

The crossing of the power canal and dam will require four 60-ft. and two 48-ft. double-track, through-girder spans. Between the dam and Bridge street there will be eight



Grand Rapids Terminal Railroad Company—General Plan of Improvements at Grand Rapids, Michigan.

quired prompt delivery, and such a contract is binding though entered into by "a general eastern agent" of the receiver in control of the contracting carrier. (Sup. Ct. U. S.) *Northern Pacific Ry. Co. vs. American Trading Co.*, 25 Sup. Ct. 84.

Use of Eminent Domain by Lessee of Franchise.—The lessee of a telegraph company cannot as such lessee exercise the right of eminent domain possessed by its lessor. (Sup. Ct. U. S.) *Western Union Telegraph Co. vs. Pennsylvania Ry. Co.*, 25 Sup. Ct. 150.

Relationship as Disqualification of Receiver.—When the appointment of a person as one of the receivers of a railroad company in foreclosure proceedings is asked by the trustees in the mortgages and other creditors and favored by practically all of the

be extended into this district. For this purpose the Grand Rapids Terminal Railroad Company was organized, and an ordinance secured from the City Council of Grand Rapids permitting a line to be built from a point on the Detroit, Grand Haven & Milwaukee just east of the bridge crossing Grand River, southerly and adjoining a dock line recently established on the east bank of the river to Bridge street, a distance of about 8,000 ft. The ordinance also provided for a further extension of the line under Bridge street and about 1,000 ft. further south, to form connection with industries established there. To build an embankment adjoining the dock line as established, it was necessary to build a protection wall in the river, about 7,000 ft. long, the face of which should be the

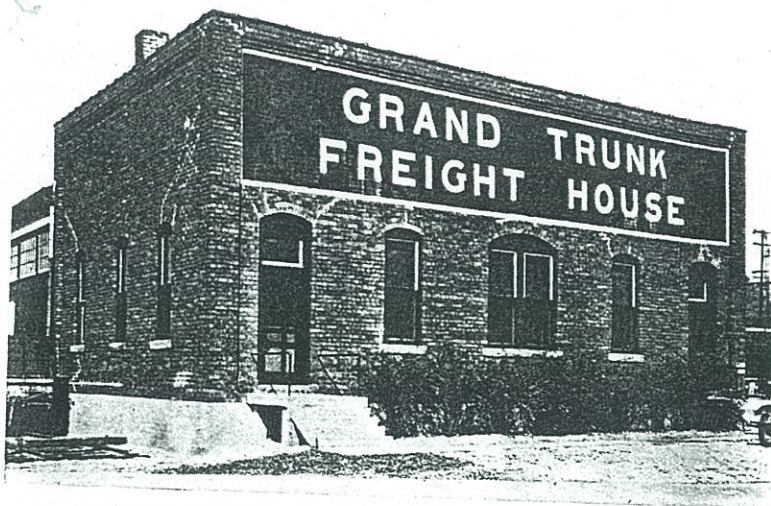
different arches from 8 ft. to 12 ft. span and of sufficient length to carry three tracks, to serve as tail-races for the various industries situated on the canal and receiving power therefrom. The masonry will all be concrete and will amount to over 16,500 cu. yds.

The foregoing information was obtained from Mr. R. S. Logan, Assistant to Second Vice-President of the Grand Trunk.

Pig Iron Production in 1904.

The Bulletin of the American Iron & Steel Association prints the following statistics of pig iron production in the United States during 1904.

The total production was 16,497,033 gross tons, against 18,009,252 tons in 1903, 17,821,000 tons in 1902, and 16,000,000 tons in 1901.



The Office Section of the Freight House After the Completion of the Work—Note the Repainted Joints in the Brickwork

Underpinning of Freight Office Overcomes Settlement

By A. N. LAIRD

Bridge Engineer,
Grand Trunk Western,
Detroit, Mich.

AFTER maintaining its stability for more than 20 years, the Grand Trunk Western freight station at Grand Rapids, Mich., built 30 years ago on filled ground, began to show signs of settlement. This settlement increased gradually but unequally and eventually forced the walls out of plumb and the floor out of level to an extent that demanded corrective measures.

The site of the building is close to the Grand river and a mill race, and from the meager construction records it appeared that the possible need for pile footings had been considered when the structure was built. The plans showed spread footings, but piles were indicated by dotted lines. However, examination disclosed that no piles had been used. By means of soil tests it was disclosed that the footings rested on miscellaneous soil and sand, intermixed with sawdust, logs and timber edgings which had

become decayed through drying out.

The freight-house portion of the structure settled unequally, from practically zero at some points to a maximum of about 3 in. The freight-office portion settled about 1 in. at the northwest corner adjacent to the freight house, approximately 10 in. at the southwest corner, 4 in. at the southeast corner and practically not at all at the northeast corner. An interior vault, built so that it is structurally independent of the building, settled very little.

Decide to Underpin

The freight office is 36 ft. by 51 ft. in plan, and consists of a monolithic concrete foundation wall with spread footings, 12-in. solid brick walls, and a wood floor supported by the outside walls and interior piers. The vault has an independent concrete slab support. The freight house is a continuation of the office structure, with steel roof trusses spanning the space between exterior walls.

Various methods were considered to prevent further settlement, and as

Sawdust, logs and waste lumber, in filled ground under the Grand Trunk freight station at Grand Rapids, Mich., decayed after the water table was lowered following the filling of a mill race. This resulted in irregular settlement of the building to a maximum of 10 in. This article tells how the footings were underpinned and the structure was raised to its original elevation in a manner that resulted in closing the cracks in the brick walls.

the soil borings indicated a solid stratum of rock about 14 ft. 6 in. below the ground level, it was decided, as a test installation, to underpin the office portion by means of rectangular concrete piers extending to rock, and to defer work on the freight-house portion until after it was learned what difficulties would be encountered in such work, and what the approximate cost would be.

Piers Built Piecemeal

This work was undertaken by contract and carried to completion as planned with a high degree of success. The excavations for the piers were approximately four feet in width by six feet in length, measured transverse to the walls. The excavations were sheeted with heavy timber lagging as the work progressed. The material was removed by hand, one man working in each pit, and was elevated to the surface by means of a portable electric hoist and a bucket. While 11 piers were required, excavation was carried on simultaneously for only 3 piers, at widely separated locations. Considerable difficulty was encountered in some of the holes owing to the presence of logs in the fill material under the footings and also to sand which washed into the

excavation. Near the low point of excavation, considerable water was encountered, which made it necessary to operate pumps periodically.

When solid rock was reached at each pier, the bed was thoroughly cleaned and a face form was set up for the concrete in the plane of the outside face of the wall footing to restrict the width of the pier to 3 ft., the timber lagging being left in place to serve as a form for the concrete on the other three sides of the pier. The piers were each carried to an elevation approximately 30 in. below the bottom of the original footings in one pour and the concrete was permitted to cure for 7 to 10 days.

After the piers were all completed to this level, the contractor installed substantial blocking between the tops of the piers and the bottoms of the old footings and placed screw jacks under the building footings at each pier, for the purpose of raising the building to a level position. However, this work was done in successive stages so that no point was raised more than two inches per day. After each jacking operation, the building was permitted to rest for 24 hours, because it was found that about that much time was required to permit the various parts of the structure to adjust themselves to the new elevation. Each jack was given a predetermined fractional turn for the resulting lift required at each point, depending on the amount of settlement, in order to remove the distortion gradually and avoid cracks in the concrete masonry and brickwork.

Restored to Position

Prior to the jacking operations there had been a slight further settlement in the building, in spite of the fact that it was being carried on steel needle beams inserted through the foundation walls and resting on heavy mud sills. At this time there were some irregular cracks in the exterior brickwork, and the top of the end wall was in the form of a bow having a mid ordinate of seven inches at the parapet. However, as the jacking operations proceeded, the cracks gradually closed, the parapet straightened out and the interior timber roof framing returned to its correct position. No attempt was made to underpin or jack the vault foundation slab, as apparently there had been no settlement in this part of the structure. As a final operation, it was necessary to true up the office floor surface slightly and repoint a few cracks in the brickwork, but when this work was completed the building had been restored to sound condition at moderate cost.

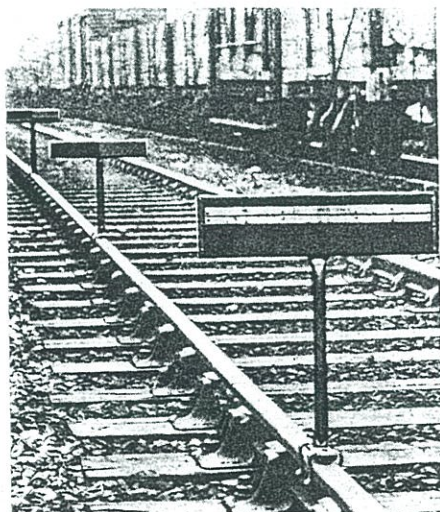
This work was performed by Hamer Brothers, Inc., contractors, under the direction of P. D. Fitzpatrick, chief engineer, Grand Trunk Western, and the writer.

How Accurate Surfacing?

(Continued from page 541)

pressure is released and the other being of the friction type so that it may be moved readily but remains at any position on the scale to which it may be moved. The end of the friction pointer opposite the indicator end is made to extend some distance beyond the pivot and a portion of the member at this end is bent at right angles to the remainder.

When in use the voidmeter is attached by means of a clamp to a steel bar about 18 in. long that has been driven vertically into the ballast at a point about 3 in. from the side of the tie and approximately the same distance from the rail. The



Sighting Boards on the Rail, Located Closer Than is Common in Practice to Permit Securing Clear Picture

device is fastened to the bar in a horizontal position at such a height that the bent end of the spring pointer rests on the top of the tie. When preparations have been completed for making the observations, both pointers are set at the lower end of the scale and both pointing to the same division mark on the scale, and are so arranged that a projecting pin on the friction pointer is in contact with the side of the spring pointer.

Thus when the tie is depressed

under traffic, the end of the spring pointer moves down with it, causing the other end to move upward on the scale and to carry the friction pointer with it. After the train passes, the spring pointer returns to the original position but the friction pointer remains at the highest reading on the scale to which it was forced by the action of the spring pointer. Hence the distance between the two pointers is a measure of the maximum amount that the tie was depressed under the train. This reading is then taken and the figure chalked on the tie. Generally six voidmeters are placed on each side of the track.

The sum of the figures obtained for each tie by the static and dynamic determinations is a measure of the amount of ballast that must be placed under the tie to compensate for the unloaded sag and for the void under the tie. The total figure obtained is in "canisters" of ballast, a canister being a cylindrical metal container $3\frac{1}{2}$ in. in diameter and $4\frac{7}{8}$ in. high. To enable canisters of the same size to be used to measure ballast for ties of different widths, short horizontal slits are cut in each container at a level $\frac{7}{8}$ in. from the top to indicate the height to which they should be filled for ties 10 in. wide. For 12-in. ties the canisters are filled to the top.

The size of the canisters is based on the use of granite "chippings" having a minimum size of $\frac{1}{4}$ in. and a maximum size of $\frac{1}{2}$ in. To prepare the track to receive the "chippings," the ballast is removed from alternate cribs and the track is jacked up sufficiently to permit the clear passage of the "packing" shovel with its charge of chippings under the ties. Since only alternate cribs are skeletonized, the chippings are inserted from one side of the tie only, being spread evenly for the width of the tie and for a distance of 15 in. each side of the rail. The shovel used for inserting the chippings has a flat blade, $6\frac{1}{2}$ in. wide by 8 in. long, and a specially shaped "goose-neck" handle.

When this method is used, it is pointed out that only sufficient chippings to overcome a combined sag of 1 in. are placed at any one time, and that it is preferable to establish $\frac{1}{2}$ in. as the maximum and, if the sag is greater than this amount, to repeat the measuring and packing process about a week later.

This article comprises an abstract of the shovel-packing process, which appeared in our English contemporary, the *Railway Gazette of London, Eng.*, to which we are indebted.

The Building Blocks

The Grand Trunk

The most important railway company established between 1850 and 1860 was the Grand Trunk Railway Company of Canada. Its name stemmed from its purpose: to operate a long, important main line which other, smaller lines would join.

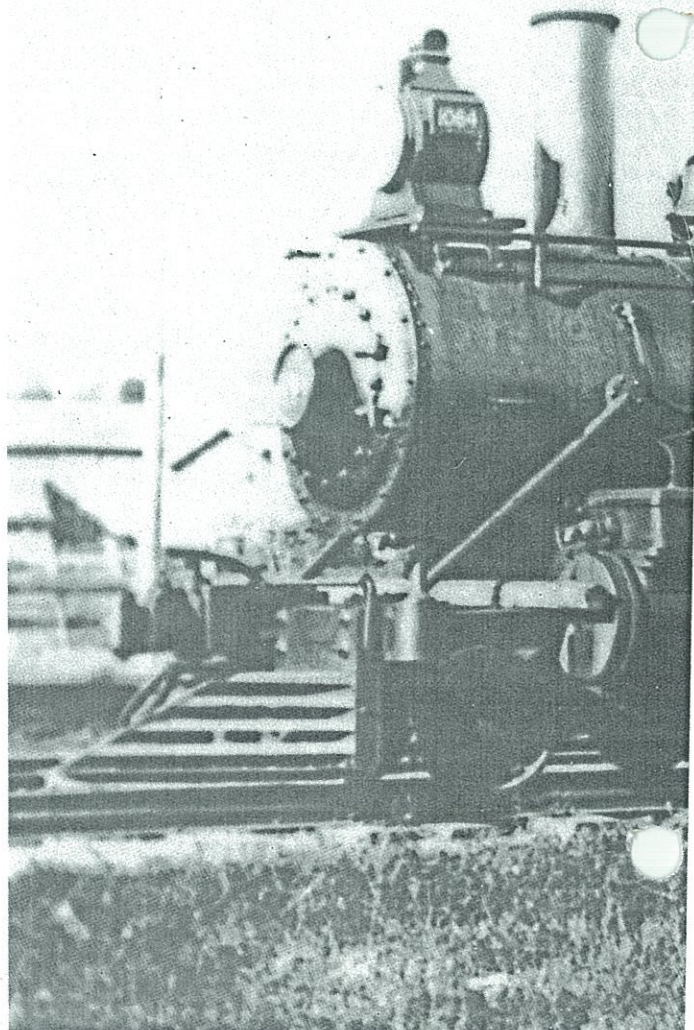
By 1851 the St Lawrence, the Great Western and the Northern were under way, and more ambitious schemes proposed. The Guarantee Act of 1849 was proving inadequate, and the government was considering an extension.

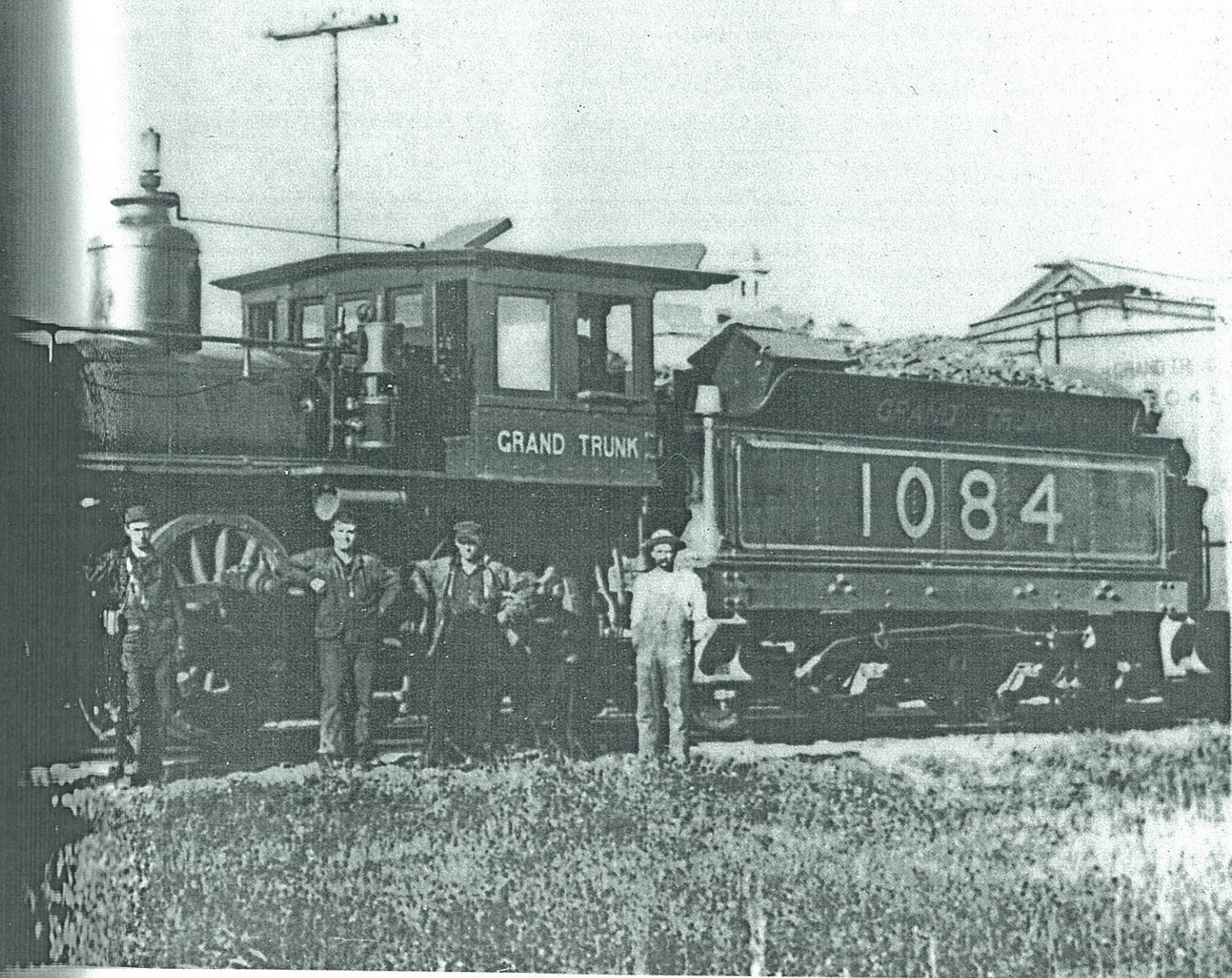
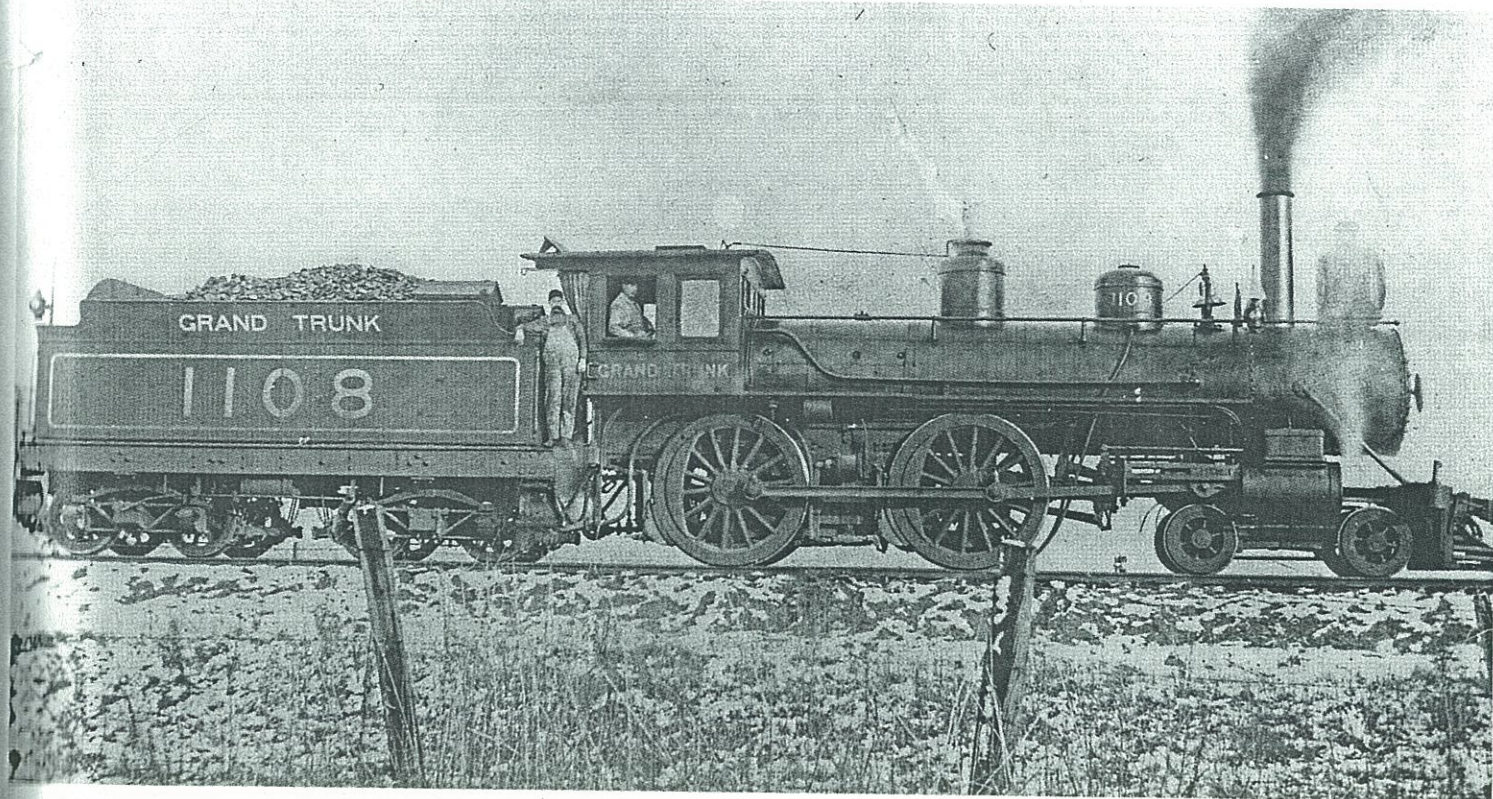
In 1849 Hincks had argued against government ownership; now he argued for it. The new act, passed in April 1852, marked the second or Grand Trunk phase of his gradually shaping policy. The next move was to arrange terms with the other provinces and secure the promised Imperial guarantee.

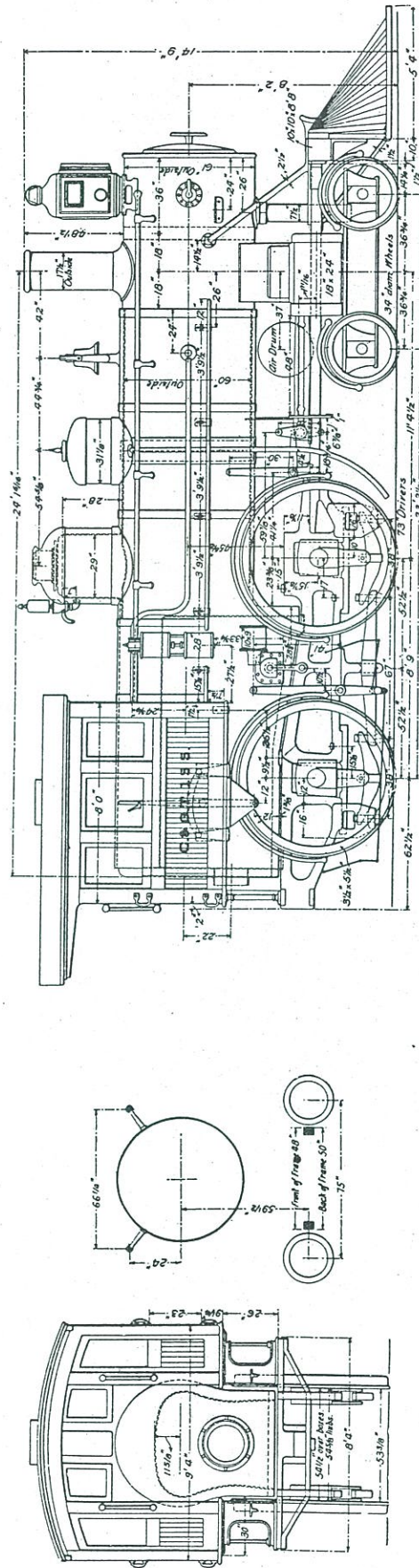
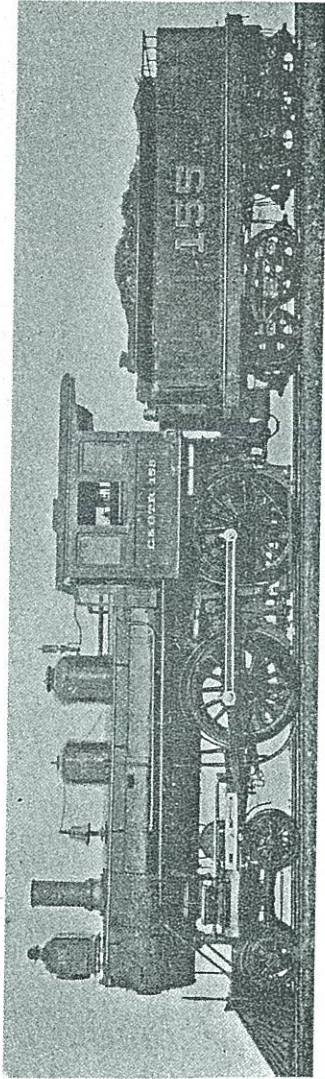
It is clear, however, that the British government was unwilling to consider anything but the unacceptable Major Robinson line. Hincks was justified in looking elsewhere for capital, but he was not justified in binding himself to one firm of contractors, however eminent, which is what he had done.

Hincks returned to Canada in the summer of 1852 with a tentative contract in his pocket. To Canada, too, came Henry Jackson, a partner in the Brassey Company, the railway-building firm with whom Hincks had associated himself. The supposition of the government was that the English contractors would simply subscribe for the bulk of the stock in these companies, but the Canadian promoters were not willing to give up their rights so easily, and they subscribed for the full \$3 million which was authorized. Hincks met this move by bringing down a bill

At right and above right: These Grand Trunk 4-4-0 coalburners were typical of North American motive power in the 1880s. Such engines were often used for both passenger and freight hauling, though their large driving wheels were conducive to building up speed, while engines with comparatively smaller wheels developed better traction.







Chicago & Grand Trunk passenger locomotive No. 155, Class B, built by the Cooke Locomotive and Machine Company, July 1893.

