Indianapolis Planning Commission Begins Active Work

Active work on a city plan for Indianapolis begins this month with the employment of Robert H. Whitten, of Cleveland, Ohio, as consulting engineer to the City Planning Commission. Mr. Whitten is to devote at least ten days a month to the Indianapolis plan and is to be paid $400 a month.

Akron Chooses City Manager

Effective Feb. 1, the City Council of Akron, Ohio, has appointed Homer C. Campbell as chief administrator or city manager, at $7,500 a year, to fill the vacancy caused by the Council in discharging W. J. Laub, who was paid $10,000. Akron is the largest city in the United States having a city manager, but Cleveland will have one early in 1924. Mr. Campbell is a native of Akron, a college and law school graduate. Recently he has been manager and secretary of the Akron Home Owner's Association and vice-president and general manager of the Coventry Land & Improvement Co.

Denver Water-Works Problems Under Survey by Engineers

A review of the present and future water supply problems of the Denver Water-Works is to be undertaken by a board of three consulting engineers. Two have been selected, Dabney H. Maury, Chicago, and Herbert S. Crocker, Denver, but the third engineer, an authority on irrigation, is still to be named. The appointment of the board follows a recommendation made by the Civic and Commercial Association shortly after the defeat of a bond issue for improvements. A statement of the water needs of the city by a disinterested engineering board is sought to create confidence in the citizens as to the needs of the plant.

Reject Plan for New Official To Study Railroad Needs

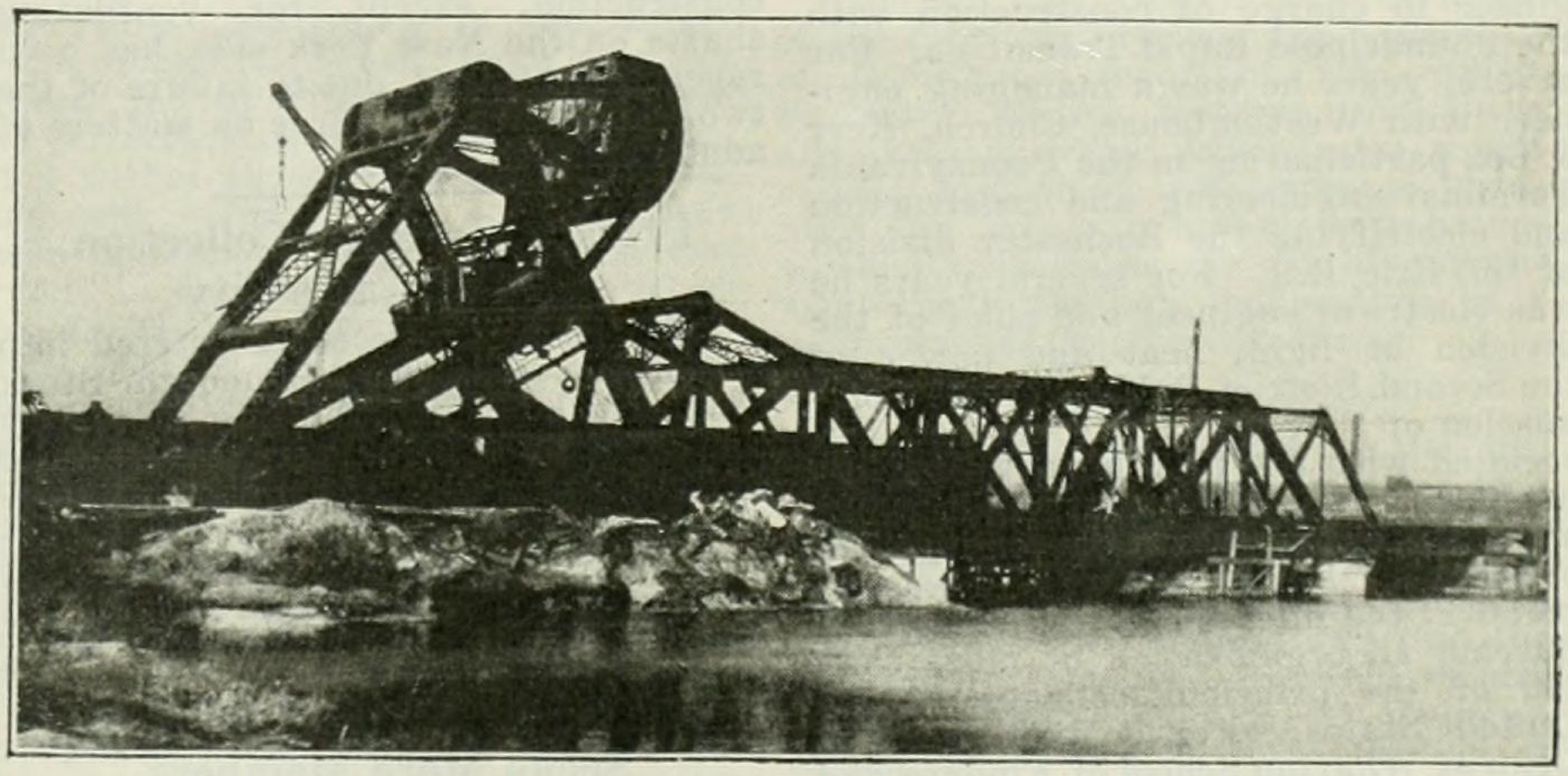
At its mid-year meeting held last week the National Council of the Chamber of Commerce of the United States refused to submit to a referendum vote of the membership a recommendation by its railroad committee that there be created a new government official who should be appointed by the President and bear the title of Commissioner General of Transportation. This official was to be charged with the duty of studying transportation problems and needs from the viewpoint of the general public and of representing the public at hearings before the various governmental bodies that deal with transportation matters.

The proposal was supported by George A. Post, president of the Hudson River Bridge and Terminal Co., and chairman of the railroad committee, and by Alexander W. Smith of Atlanta, another member of the committee. The opposition was led by Alba B. Johnson of Philadelphia, president of the Railway Business Association. Disapproval was voiced also by Herbert Hoover, Secretary of Commerce and Howard Elliott, president of the Northern Pacific R.R., both of whom believed that existing laws and agencies looking to the same end have not yet had time to demonstrate their utility.

New Type of Bascule Bridge At Detroit

At the crossing of the Wabash RR. over River Rouge, Detroit, a bascule bridge of radically new type has just been built to replace an old swing bridge. The photograph reproduced herewith, taken last week, shows the new structure completed.

The new bridge was made necessary by improvement of the channel to a width of 300 ft. with depth of 20 ft., which required a width through the draw of 125 ft. The old structure was a single-span swing bridge about 180 ft. long with a pivot pier in the center of the stream. The new structure is a single-lead double-track bascule bridge designed for Cooper's E50 loading, with 162-ft. lift span. The total length is 291 ft. including A-frame and deck plate-girder approach. In addition to carrying Wabash trains this bridge is used by the Baltimore & Ohio, Detroit & Toledo Shore Line, Pere Marquette, and Pennsylvania R.R. A three day count showed 113 trains in 24 hours or a train every 13 minutes.



WABASH RAILROAD'S NEW TYPE OF BASCULE BRIDGE

The foundations for the A-frame at the trunnion end of the bascule were placed west of the original west abutment, the rest pier between the pivot pier and east abutment. Foundations were carried to rock 88 ft. below the base of rail by pneumatic caissons. Hydrogen sulphide gas was encountered a short distance above the rock, at about 30 lb. air pressure in the caissons; this gas gave no difficulty when the pressure was raised to 40 lb.

The steel structure was erected with the leaf lifted, leaving out certain floor beams and stringers giving a portal for the passage of trains. Just before the leaf was lowered the old draw span was rolled upstream on temporary bents. When the leaf was lowered the omitted members were then erected and the approach girder span set in place, all of which was done in 7¼ hr. Steel erection was started July 1, 1921, and leaf closed Jan. 26, 1922.

The lift is operated by the strut supporting the counterweight traveling down an inclined track. The operating controls are completely interlocked. Safety brakes to hold the strut fixed to its track are provided. The motive power is supplied by two 100-hp. 440-v. A. C. motors, and in emergency operation by a gasoline engine.

To give the channel its full width it is now necessary to remove the old pivot pier and west abutment.

Congress to Consider New Federal Aid for Roads

Hearings to Begin on Woodruff Bill—Highway Officials Oppose Soldier Bonus from Road Revenues

(Washington Correspondence)

Active consideration of legislation authorizing appropriations for federal aid roads has begun in the House of Representatives. The Woodruff bill, which authorizes the appropriation of $100,000,000 annually for a period of five years, is to be the basis of the work which will be done by the committee on roads. Hearings on that bill probably will begin Feb. 17. Since the President has expressed the earnest wish that the annual expenditure be not greater than $75,000,000, and has indicated that he would not be displeased if it were found that $50,000,000 were adequate, it is regarded as probable that the committee will reduce the amount of the annual appropriation carried by the Woodruff bill.

W. C. Markham, legislative representative of the American Association of State Highway Officials, states that his organization is making a careful survey of the amounts which each state can absorb and will not ask for more federal aid than can be taken up within the year. He points out, however, the necessity for planning ahead, especially with the 7 per cent system called for in the Act of Nov. 9, 1920.

The American Association of State Highway Officials, Mr. Markham says, will fight to the last ditch against the proposal to raise soldier bonus money by federal taxes on automobiles and gasoline. Such action, he points out, would usurp the sources of taxation on which the states are relying for their maintenance funds. Fifteen states already have levied a gasoline tax. Three legislatures are in session at this time which will act on bills providing a gasoline tax. Next winter the legislatures will meet in thirty-four states. Mr. Markham predicts that practically every state will resort to this source for funds for road construction and maintenance. Were the Federal Government to add another tax on gasoline and automobiles, the burden would be out of proportion and would cause a very unfavorable reaction. Mr. Markham makes it clear that the highway officials are not fighting the soldier bonus. The organization is convinced, however, that this money should be raised from sources.

account of the excessive cost and is unnecessary in the existing circumstances."

In a minority report, James A. Bailey, chairman of the Metropolitan District Commission (which operates the present Metropolitan water system) agrees with the other members of the Joint Board as to the advisability of going to the Ware River but not as to its immediate urgency or as to its being certain that no storage should be provided on the Ware. He recommends that the Legislature make a moderate appropriation for further studies of the Ware, but that it authorize no taking of lands or construction of works at this session. He thinks that the Metropolitan Water District, together with any likely enlargement meanwhile, will not "need additional water before 1935." He bases this on the possibility of checking the increase in consumption, and on the slow growth of the district.

New Type of Trunnion Bascule Bridge: Wabash Ry.

Link System in Abt Design Connects Machinery Girder Traveling on Incline with Movable Counterweight Pivoted to Bridge Side of Tower

A NEW type of trunnion bascule bridge has been built for the Wabash Ry. Co. crossing of the River Rouge near Detroit, and was put into service Jan. 26. The bascule span, shown by the views in Fig. 1, is 162 ft. long. It is flanked by a 73½-ft. span at one end to carry the counterweight tower and a 53-ft. approach span at the other end, the total length of the bridge being 291 ft. The new design is considered to be more economical than other types.

A contra-rotating counterweight mounted on the bridge side of the tower and a link system connecting this counterweight with the bascule leaf form the special features in the design. From the drawing, Fig. 2, it will be seen that the link system is composed of four members: (1) a rocking link pivoted to the trunnion and having its head connected to the hip joint at the top chord; (2) the tension member or link attached to the head of the rocker and through it connected to the top chord of the truss; (3) the compression link supporting the counterweight, and (4) the counterweight arm pivoted to the tower.

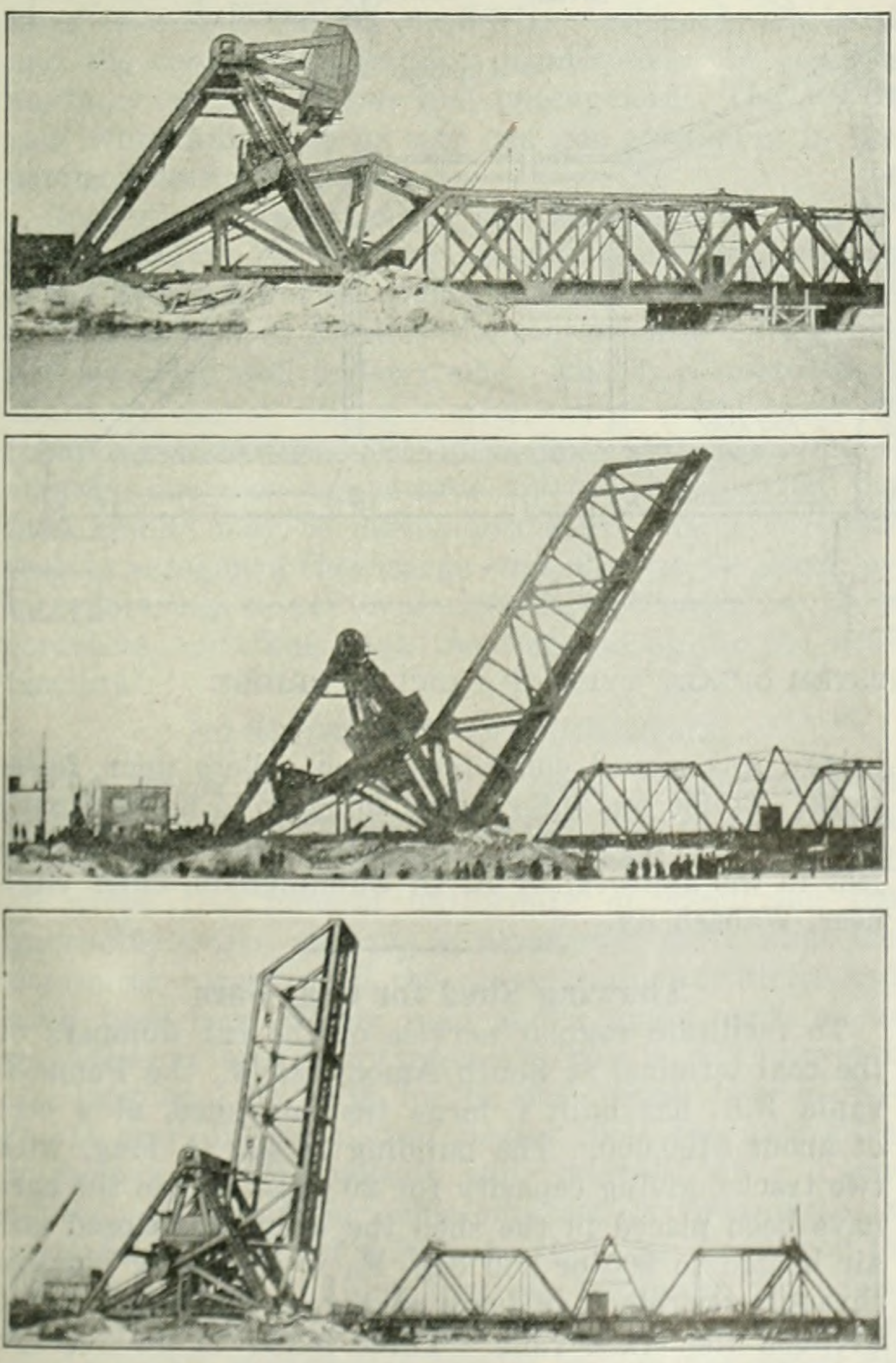


FIG. 1. WABASH RY. BASCULE BRIDGE OVER RIVER ROUGE, DETROIT

Top, bridge lowered; middle, bridge partly raised; bottom, bridge in full raised position.

The tension and compression links (2) and (3) are both pivoted to a heavy transverse girder which carries the machinery and which travels on inclined rails in the tower framing. Operating pinions on this girder engage with racks on the inclined path. As this girder is moved down the incline it raises the bridge. At the same time it allows the counterweight to swing downward and thus exert a thrust against the girder to counterbalance its pull on the leaf.

The counterweight is a steel basket filled with concrete. Since the bridge was erected in the open or vertical position the counterweight hung suspended from its bearings, which facilitated placing the concrete fill. The counterweight weighs about 1,000 tons. Adjustments of weight are effected by means of separate concrete blocks weighing 2,500 lb. each. The weight of the moving leaf approximates 400 tons. The main trunnions are 26 in. in diameter and 19 in. long.

Bascules of four different types and a vertical-lift span were considered in the preliminary designs for this bridge. The bascule designs were as follows: (1) A plan prepared by the engineering department of the Wabash Ry., having a counterweight attached rigidly to the leaf; (2) a Strauss bascule bridge; (3) a design originated by C. G. E. Larsson, of the American Bridge Co., New York, which required no counterweight and was to be operated by combined pneumatic and hydraulic machinery; (4) a bridge similar to the type patented by Elmore D. Cummings, St. Paul, Minn. It is understood that no bridges of the last two types have been built, and the Cummings patent (Dec. 31, 1901) has now expired.

This fourth design as submitted originally by the American Bridge Co. included features which were similar to those of the Cummings patent, although that patent was not known to the representatives of the company until later. Mr. Cunningham, chief engineer of the Wabash Ry., informed the company that a model of a similar design had been submitted to him when he built his first bascule bridge, but that he objected to it on account of the flexible connection (chain or cable) of the counterweight to the bridge. After a thorough study of this type of bridge the American Bridge Co. modified its design by using two links for connecting the counterweight to the trusses, which design was submitted to Mr. Cunningham and approved by him. This new design, which has been patented, was prepared by Hugo Abt, of the company's designing department, under the direction of Albert Reichmann, division engineer.

Two 100-hp. electric motors are installed in the machinery house located on the traveling cross-girder. One of these is sufficient to operate the bridge; clutches are provided so that either motor can be used alone. For auxiliary power there is a 58-hp. gasoline engine. One motor can open or close the bridge in less than 1½ minutes, but with the gas engine the time is about 8 minutes. Each motor has a solenoid brake for full torque, that is, for holding the leaf in any position. One of these brakes has an attachment for converting it into a hand brake when the gasoline engine is to be used. On the motor shaft is an air brake designed for the full torque of the two motors.

Two emergency brakes, entirely independent of the operating machinery, grip I-beams laid along the inclined track girders of the tower. Each of these can develop a holding power of 88 tons. These grip brakes are operated by compressed air, the supply being independent of that to the air brake on the motor shaft. All brakes are arranged to set slowly and release quickly. A compressor with a capacity of 25 cu.ft. of free air per minute keeps the receiver pressure automatically at 100 lb.

The bridge is operated from the second floor of the operator's cabin on the approach, on which floor is also installed the interlocking machine for the railway signals. Electrical interlocking of the bridge mechanism with the track connections and signals is so arranged that the bridge cannot be operated until the signals have been set properly and that the several operations must be performed in regular sequence.

The bridge is designed for E 50 loading on each track. It is dimensioned according to the specifications of the American Railway Engineering Association, and its machinery according to that association's proposed specifications for movable railway bridges.

Fabrication was done at the Gary plant of the American Bridge Co. Erection was in charge of James L. DeVou, division erecting manager of the same company. Electrical, air and gasoline equipment was furnished and installed by the Norwood-Noonan Co., Chicago. Signal and interlocking plant was provided by the Union Switch & Signal Co. The substructure was built by the J. W. McMurry Contracting Co., of Kansas City, Mo. To avoid interference with traffic, the bridge was erected in the vertical or open position at one end of the old swing bridge, which continued in use until the new structure was practically completed. Then the old bridge was moved out laterally on rollers upon falsework. Traffic was interrupted for only 7½ hours during this change. All design and construction work was subject to the approval of A. O. Cunningham, chief engineer, Wabash Ry.

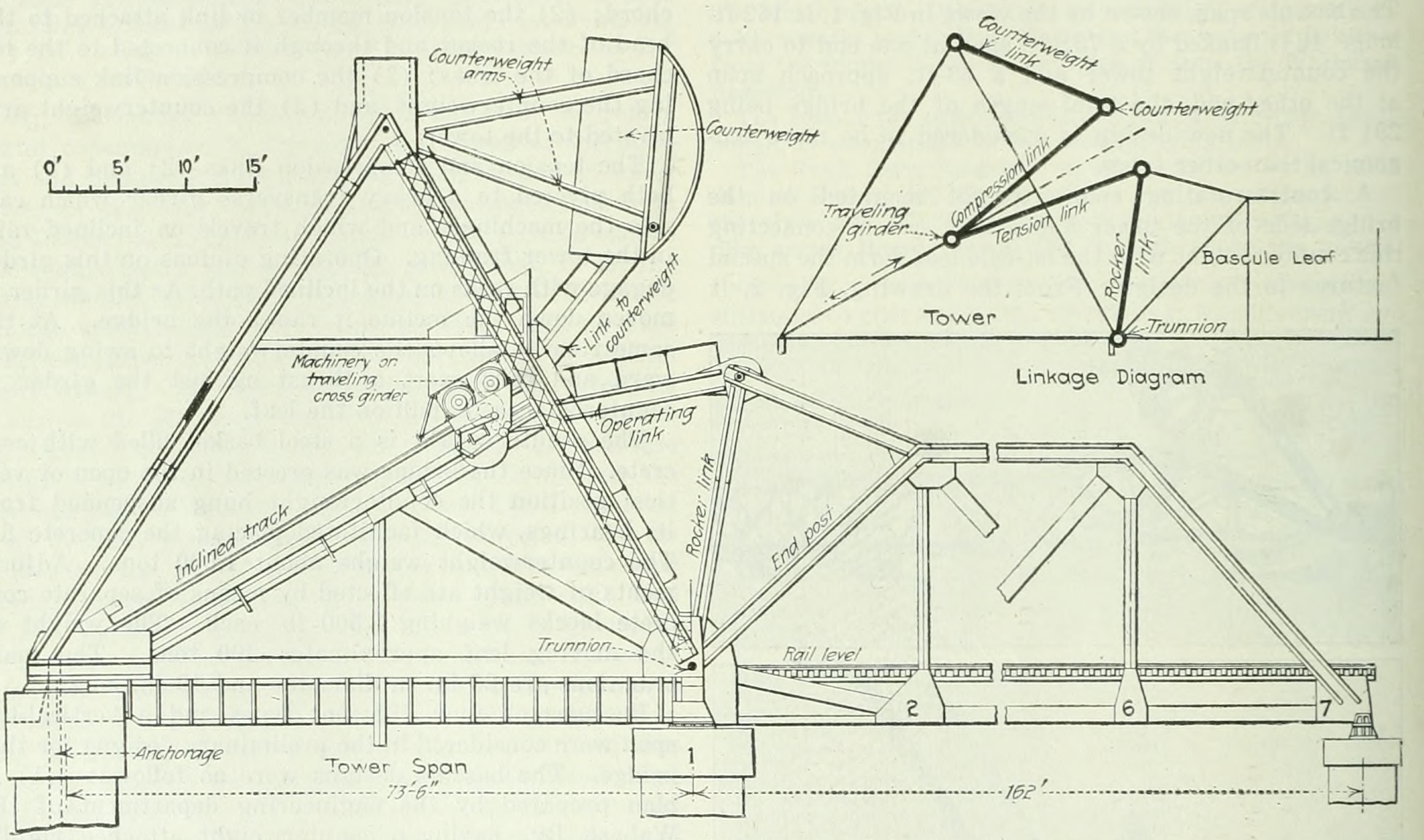
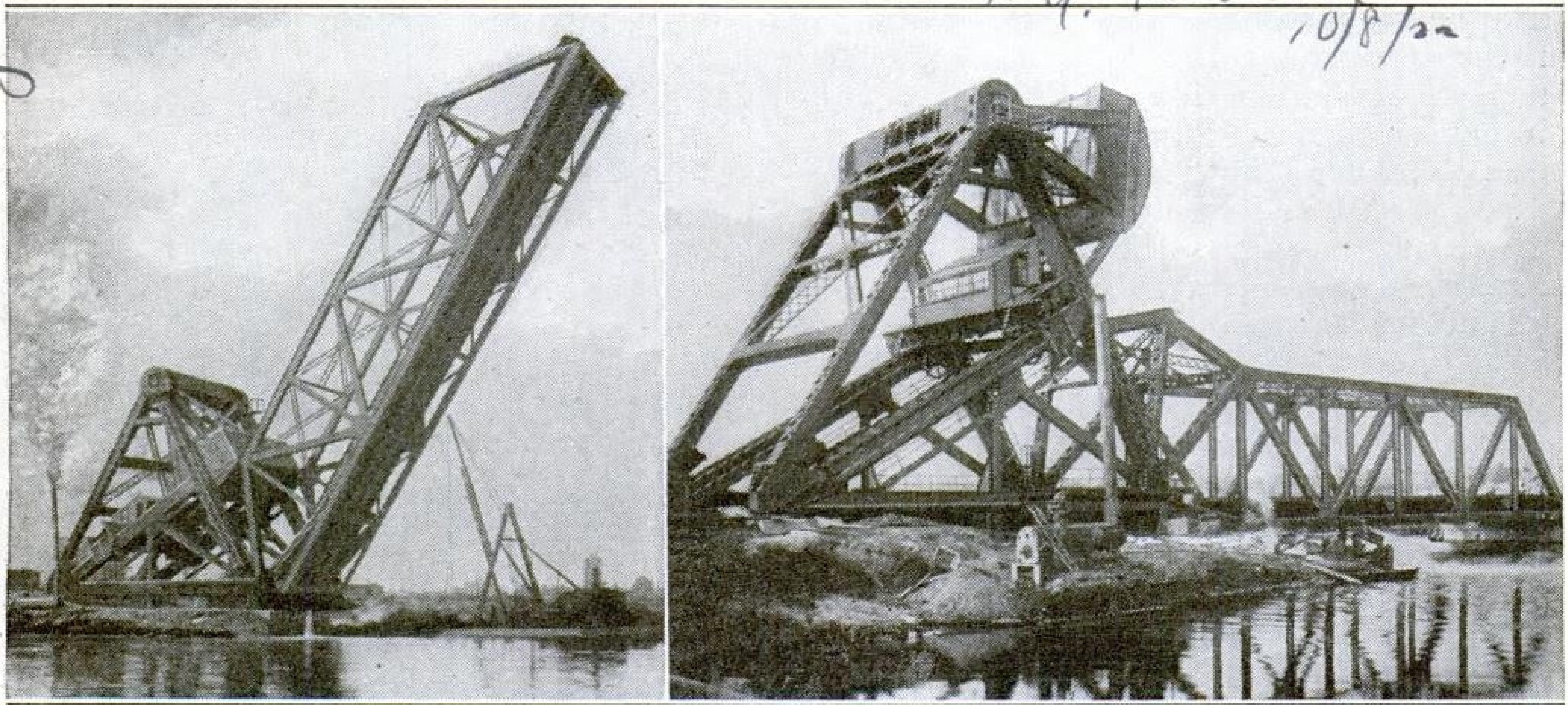


FIG. 2. OPERATING AND COUNTERWEIGHT SYSTEM OF ABT TYPE OF BASCULE BRIDGE

Thawing Shed for Coal Cars

To facilitate regular service of the car dumpers of the coal terminal at South Amboy, N. J., the Pennsylvania R.R. has built a large thawing shed, at a cost of about $100,000. The building is 448 ft. long, with two tracks, giving capacity for 20 cars. When the cars have been placed in the shed the doors are closed and air heated to 200 or 250 deg. F., is forced by blowers through concrete-floor ducts having openings 6 ft. apart between the track rails. Three hours is an average time for thawing, but the actual time varies from one to twelve hours, depending upon the weather and the condition of the coal. From the shed the cars are moved by gravity to the car-dumping machines.



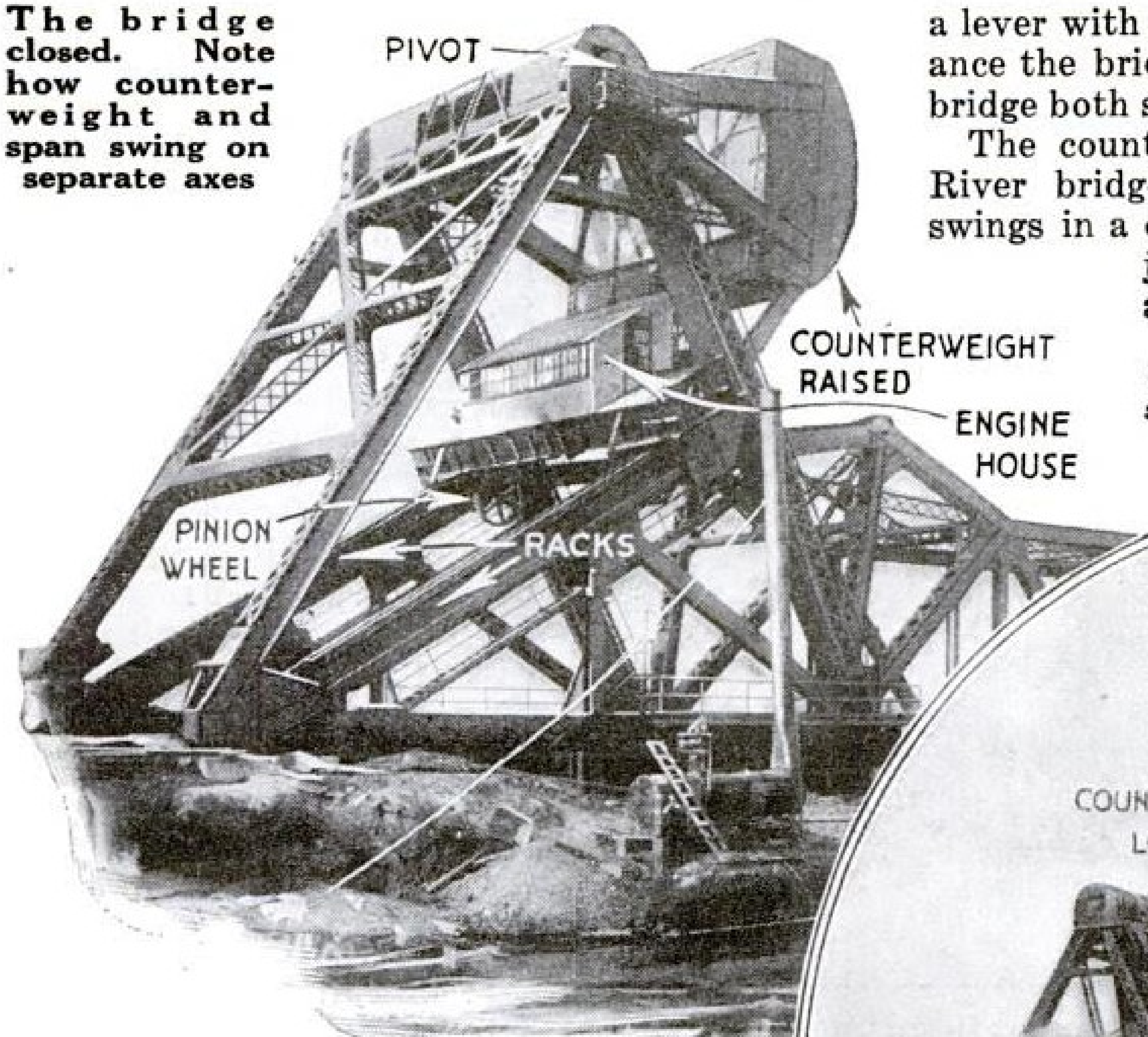
Left: New Type of Bascule Bridge Operated by a Moving Counterweight, Shown Open with the Counterweight Moved Down into the Supporting Tower. Right: The Bridge is Shown Closed with the Counterweight Moved Radially Upward, So That It Hangs Directly above the Bridge Trunnions

BASCULE BRIDGE CONTROLLED BY MOVING COUNTERWEIGHT

A new bascule railroad bridge, with a span of 162 feet, across the Rouge River at Detroit, Mich., the first of its kind ever built, has a movable counterweight which controls the raising and lowering of the bridge. In every other respect it is like any trunnion bascule bridge. The counterweight weighs 1,000 tons, and is supported at a considerable height above the bridge in a strong steel tower, at the apex of which are bearings for trunnions, on which the counterweight swings at the end of connecting brackets radially at some distance from the center line of the trunnions. This movement of the counterweight is controlled by machinery installed inside a cabin on a transverse steel girder, that travels up and down two inclined steel supports moving the counterweight with it. The machinery is driven by a 50-horsepower motor, another similar one being provided for reserve power. Thus the counterweight is shifted with relation to the bridge trunnions so that, when it is directly above them, it holds the bridge closed, and when moved to a position at some angular distance from the bridge trunnions, opposite to the bridge, its downward pull forces the bridge upward, opening it. The tower supporting the counterweight is above the approach, which is 73½ feet long.

Source: Popular Mechanics, December 1922

Novel Counterweight Bridge Opens in 90 Seconds



The bridge closed. Note how counterweight and span swing on separate axes

A REMARKABLE railway bascule bridge, in which the counterweight and the bridge span swing on different axes, is now in operation across the Rouge River, where the tracks of the Pennsylvania and Wabash railroads lead into Detroit, Mich. The structure, called the "cross-rotating" type of bascule, is said to be the only one of its kind in the world. One of its extraordinary features is the motor house, which travels up and down an inclined track, following the movement of the counterweight, and which actually forms part of the weight itself.

The ordinary bascule operates simply as a lever with a counterweight to balance the bridge proper. Weight and bridge both swing on the same axis.

The counterweight of the Rouge River bridge, on the other hand, swings in a quarter circle on a pivot just beneath the apex of a tall triangular steel frame, while the bridge proper is pivoted at the base of the frame. Bridge and counterweight are connected by jointed girders.

When the bridge is down, the counterweight is suspended in a horizontal plane, where it is locked against movement by racks and cogs of the incline. When the bridge is raised, the counterweight swings downward in a half circle, while the motor house moves down the incline in front of it.

Counterweight swings downward, raising the span

Less Power Needed

This arrangement is said to require less power for operation than the ordinary bascule and is quicker in opening and closing the bridge. A 100-horsepower electric motor opens and closes the bridge in 90 seconds.

An extra motor is provided for use in case of a breakdown. A gasoline engine that will open the bridge in eight minutes is also available.

Concrete blocks, each weighing 2500 pounds, make up the 1000-ton counterweight. The movable span is 162 feet long. In the power house is mechanism that prevents operation of the bridge until all signals are set.

Source: Popular Science, January 1923