

Fig. 3—Twin batchers load bulk cement in fast time. Third batch to complete truck-load is ready by time the truck has been re-spotted to receive it.

ing one truck requires only 30 seconds. The photograph, Fig. 3, was taken during the discharge of cement into the truck, showing that there is practically no dusting of cement in this operation.

Cement is hauled a distance of 100 miles from Monolith, Calif., in special trucks equipped with cylindrical tank bodies that are hinged to the truck frame at the rear end. At the rear end of each tank is a hinged steel door. No hoist is included in the truck; instead, the tanks are emptied by means of overhead cranes equipped with gasoline hoists mounted on the steel framework, as shown in Fig. 2. The tanks are lifted to an angle of about 60 deg. from the horizontal in being discharged. The cement is discharged from the tank through a canvas funnel into the steel receiving hopper that leads to the horizontal screw. Each truck has a capacity of 50 bbl. The trucks operate in units of a truck and trailer, each hauling 50 bbl., or 100 bbl. to the load.

This project is being built by the Jahn & Bressi Construction Co., of Los Angeles, with Joseph Muscolo as superintendent in charge. W. I. Templeton is resident engineer for the highway department. Information for this article was supplied by the Blaw-Knox Co., which designed and furnished the plant.

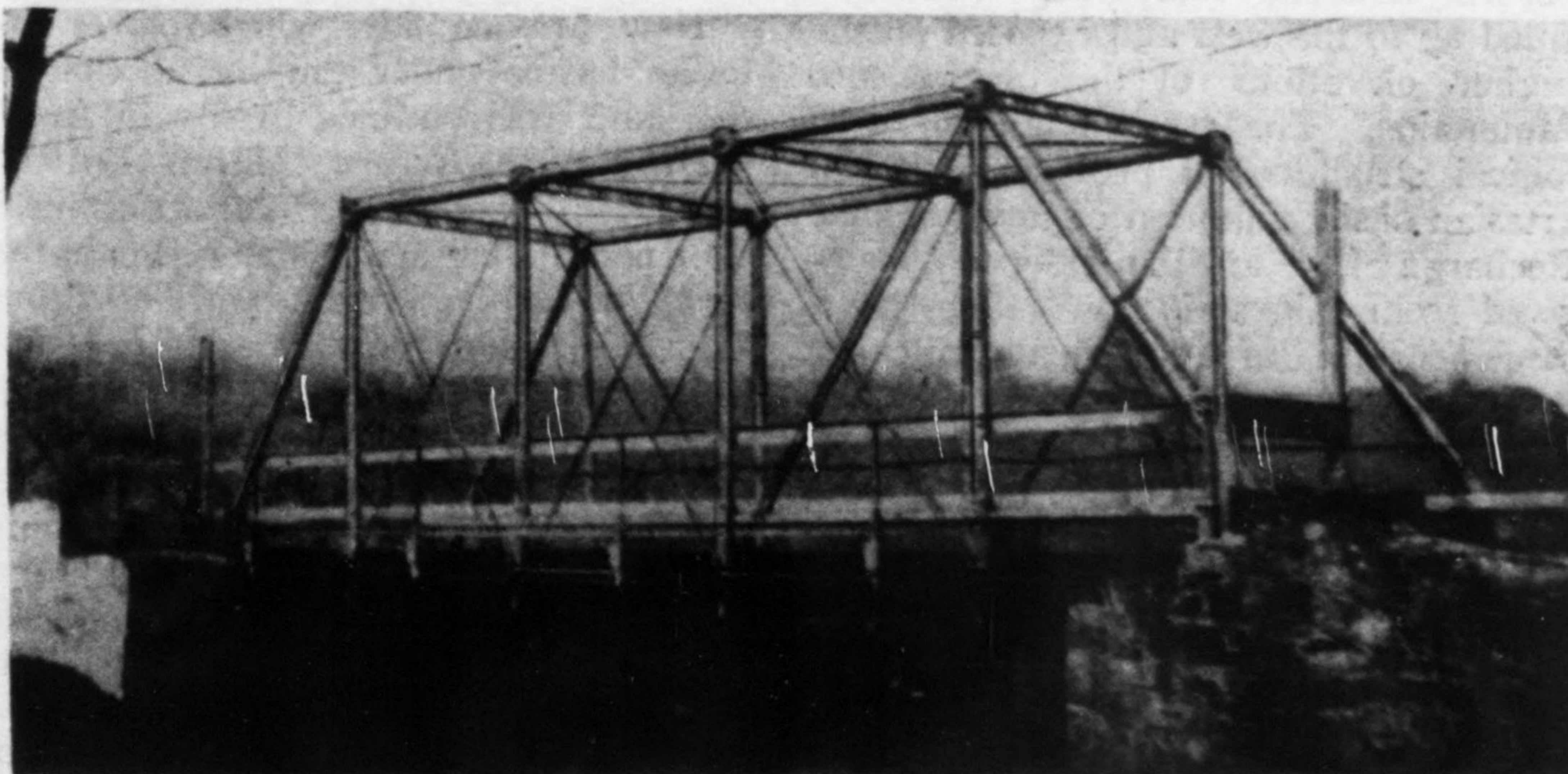
Sixty-Year-Old Trusses of Cast Iron Still in Service

Pennsylvania structures contain interesting details including unusual connection castings

By Harry K. Ellis
County Engineer, Chester County,
West Chester, Pa.

TWO BRIDGES built almost entirely of cast iron are still in service over Saucon Creek, near Bethlehem, Pa. One of them (Fig. 1), is located on Walnut St., Hellertown, and is a through-truss span of 55 ft. 5 in. center to center of bearings. It

Fig. 1—Cast-iron truss bridge of 55-ft. span at Hellertown, Pa. Top chords and verticals are circular.



originally carried a sidewalk on one side, but this has been removed. The cast-iron sidewalk brackets and a light cast-iron railing remain in place.

The trusses are 12 ft. on centers and 14 ft. 8 in. deep. They are built with all compression members of cast iron. The top chords and end posts are circular in section and taper from a maximum outside diameter of 7 in. near the middle to a lesser diameter at the ends. The posts are similar in section but with a maximum diameter of 5 in.

Diagonal web members are rods of 1 and 1½ in. diameter, not upset. Connections are made by passing the rods through the ends of the cast-iron vertical posts and fastening them with a nut on each end. This is shown in Fig. 2. The lower chords consist of four rods of 1-in. diameter in the end panels and 1½-in. in the center panel. The smaller rods are upset but the larger ones are not. They are spliced together with a sleeve nut just outside the center panel. This may be seen in Fig. 2.

The floor beams also are of cast iron,

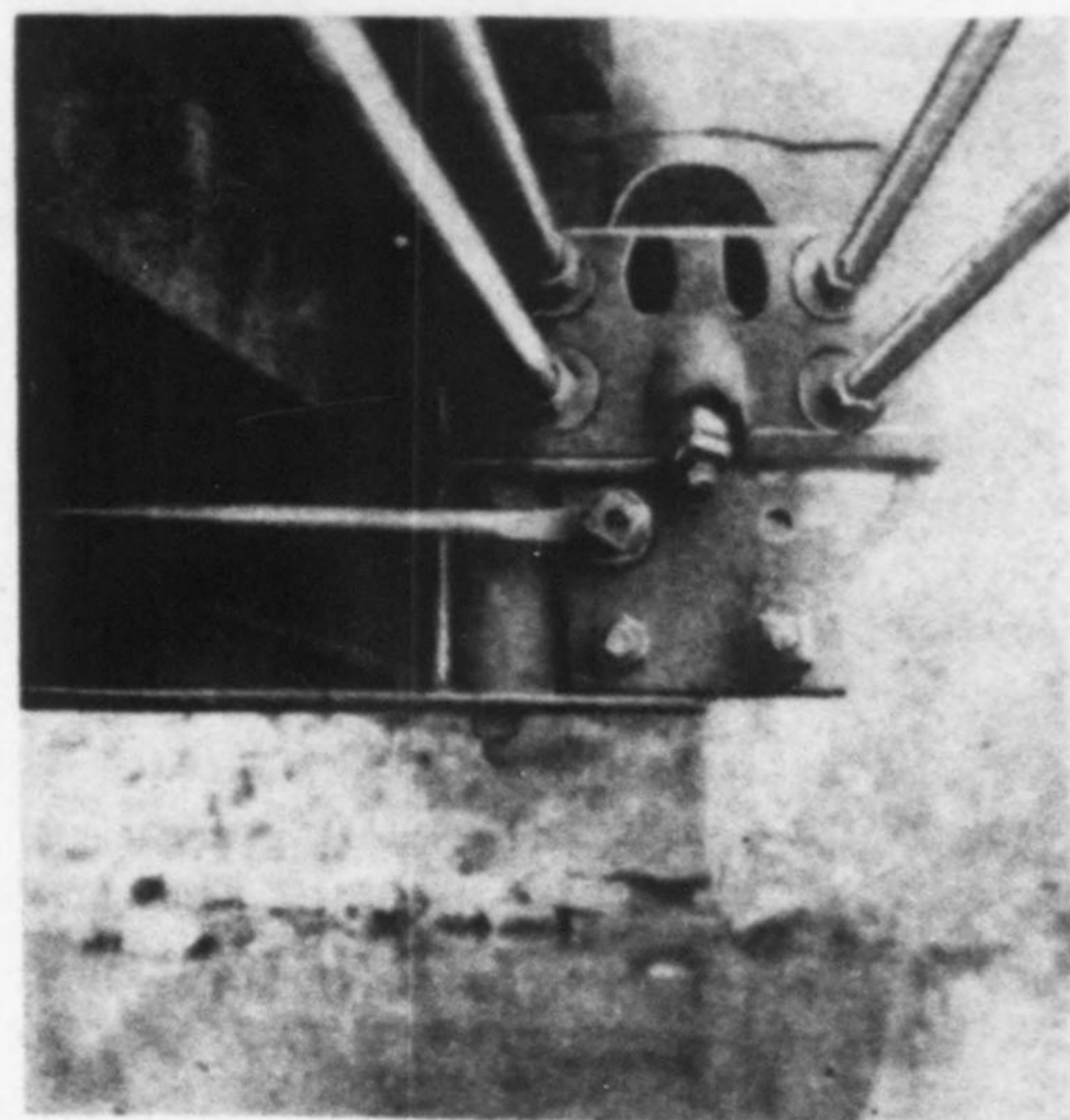


Fig. 2—Bottom panel-point casting on Hellertown bridge providing connection for diagonals, chords and floor beams.

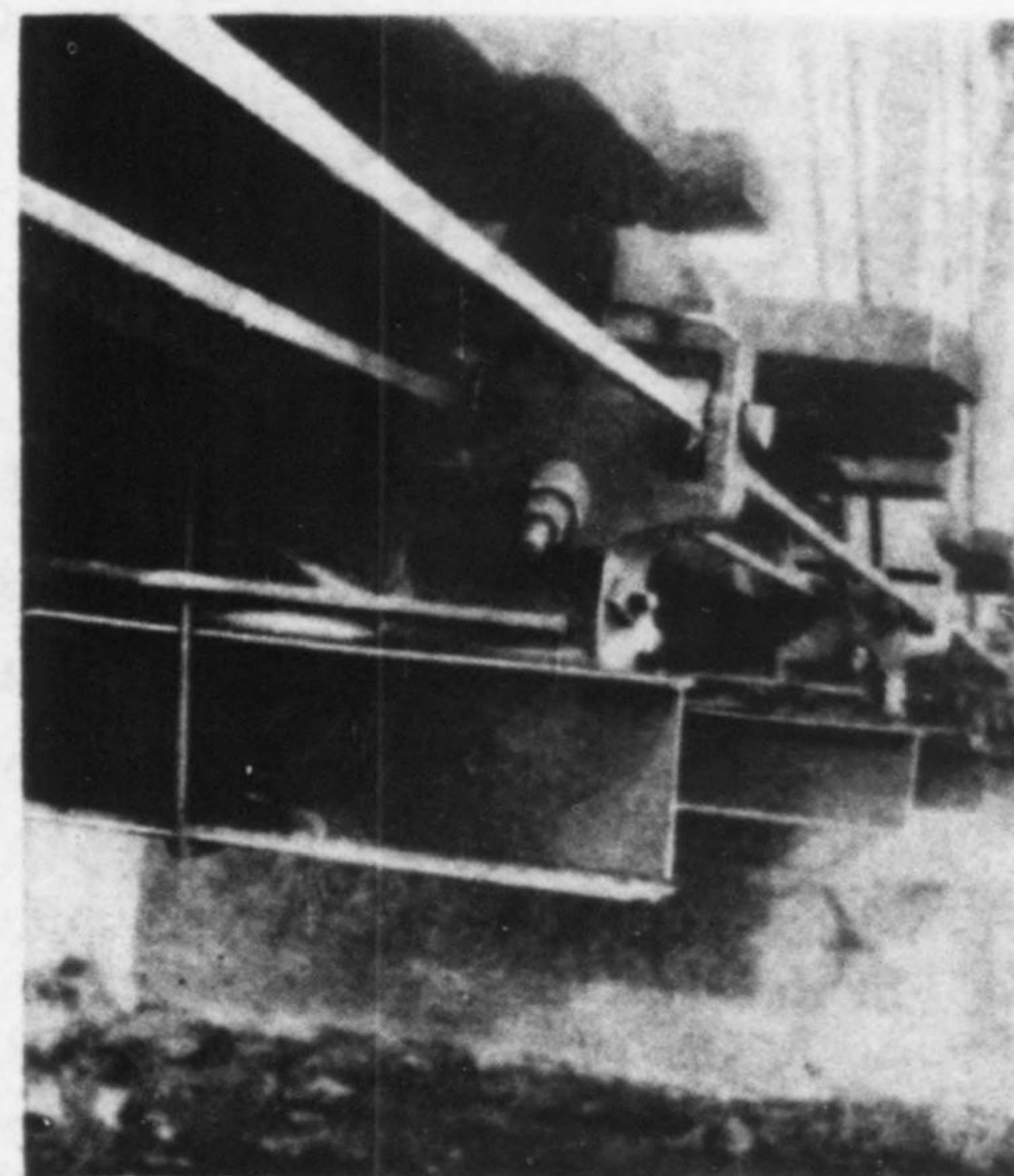


Fig. 3—Bottom panel-point detail of continuous-type cast-iron bridge. Note steel I-beams used to reinforce old cast-iron floor beams.

11½ in. deep. The flanges are 4½ in. wide with a minimum thickness of ½ in. Diagonal and vertical stiffeners are cast integral with the web.

The top lateral system is of rods with cast-iron latticed struts at the panel points. No portal or swaybracing is used. The lower laterals are rods of ¾-in. diameter in the intermediate panels and 1-in. diameter in the end panels.

At the second crossing upstream from the Walnut St. bridge is a two-span continuous cast-iron bridge built by C. N. Beckel of Bethlehem in 1870. The spans are 51 ft. 10 in. center to center



Fig. 4—Continuous-type truss bridge of cast iron in two spans of 52 ft.

of bearings, and the trusses are 15 ft. on centers and 7 ft. 10 in. deep. All compression members are octagonal in shape, the top chords and end posts being 6 in. in short diameter and the vertical posts 4½ in. All diagonals are of rods which pass through the truss castings. The upper ends of the rods are formed into a round rivet head, and

the lower ends are threaded and fastened with a nut. None of the rods has upset ends.

The lower chords are square eyebars connected to the panel points with pins. The trusses are not truly continuous, for the lower chord is a tension member in all panels. Probably the designer had continuity in mind, however, for the diagonals in the middle panel of each span consist of two 1-in.-diameter rods

in one direction and a single rod of the same diameter in the other direction, as would be required in a continuous span.

The floor beams are of cast iron, 10 in. deep and similar in construction to those used in the Walnut St. bridge. One of them has broken, and all of them have been reinforced by fastening steel I-beams beneath them. Horizontal rod bracing forms the lower lateral system.

The expansion bearings of this bridge consist of a cast bed plate upon which

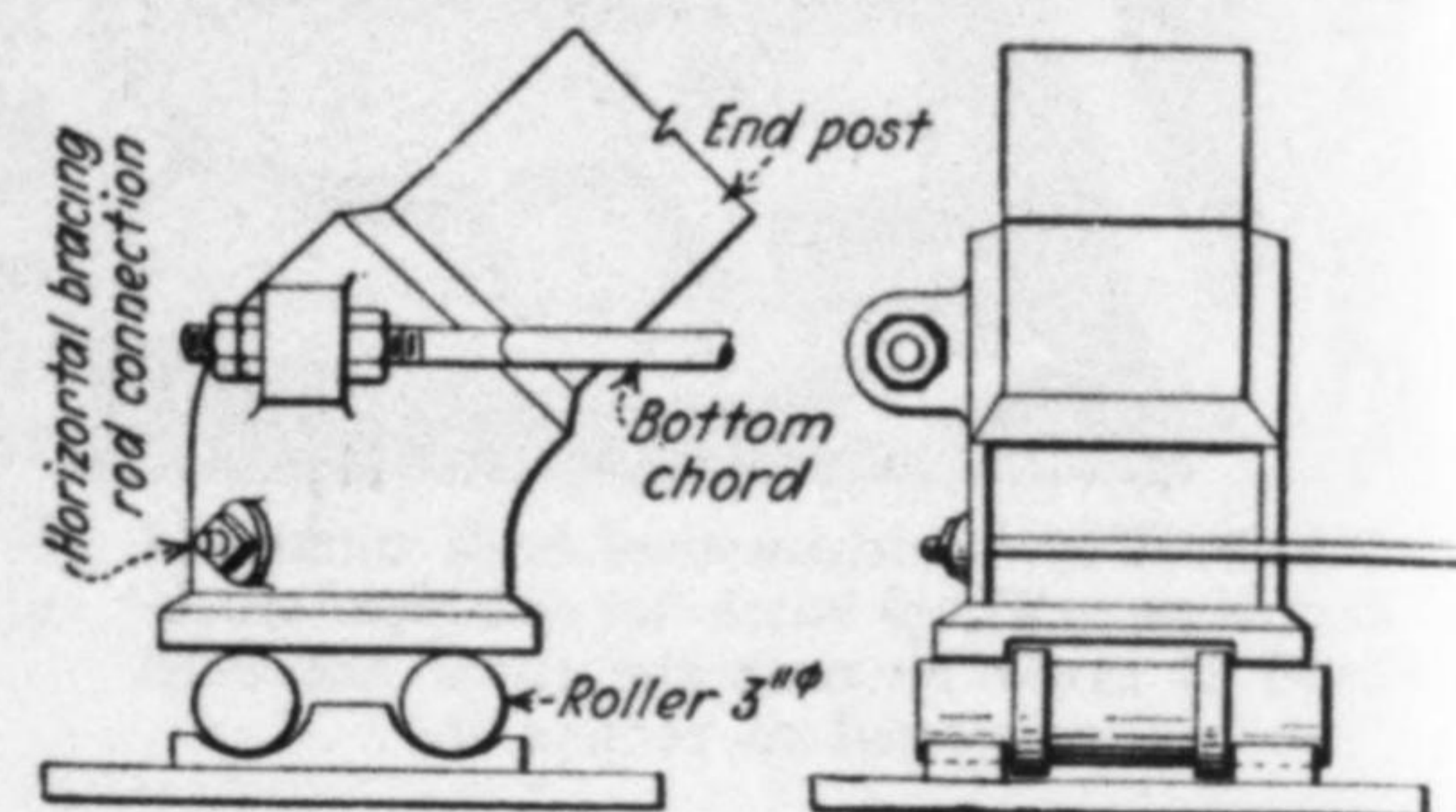


Fig. 5—Sketch of cast-iron expansion bearing on continuous-type bridge.

rest two 3-in.-diameter rollers. The upper surface of the bed plate is rounded as shown in Fig. 5. Except that the truss casting does not rest centrally upon the rollers, the bearings are in excellent condition.

Well-Plugging Program Saves Irrigation Water

Old leaking wells in Roswell artesian base in New Mexico have been a constant source of water loss—Situation outlined and plugging method described—State program wins support of water users

TO CONSERVE the water supply in the Roswell artesian basin, one of the most productive agricultural areas in the state of New Mexico, a program of plugging old leaky wells is in progress. Continued decline in the irrigation supply for more than a decade resulted in the passage of a law in 1931 giving the state control of the underground supply by declaring it appropriable, and also provided a fund to institute the well-plugging program. As hoped, this action of the state has been effective in arousing the water users, and a conservation district has been formed which will take over and carry on the conservation program. After considerable experimenting in the plugging of the first four wells, operations have been improved and eight wells have been plugged, resulting in a saving of 10 per cent of the irrigation demand.

The Roswell artesian basin is situated in the Pecos Valley in southeastern New Mexico. The area irrigated by water

derived directly or indirectly from this artesian reservoir is about 60,000 acres. Underlying the valley fill of alluvial clay and sand there are thick strata of sand and shale. Below this impervious formation at depths varying from 300 to 1,300 ft. is a series of limestone strata several hundred feet thick which is tilted up to the west and exposed on the higher elevations of the Sacramento Mountains. The other details of geological structure all provide a typical artesian basin condition of unusual size. Recharge of the artesian reservoir is derived from rain and snow falling on a catchment area of 4,000 square miles on the mountains to the west.

Artesian flow originally extended over an area of about 650 square miles. Extensive use of this underground reservoir, with expanding irrigation demand, decreased the area of artesian flow to about 500 square miles in 1916 and still further to about 425 square miles in 1925. It is estimated that the area in

1932 had not been further decreased. Production from wells in this area amounts to about 200,000 acre-ft. per year, and other surface discharges bring the total to about 250,000 acre-ft. Aquifer pressures vary from 50 to 600 lb. per sq.in., with a general average surface pressure of about 10 lb.

Studies of the artesian basin as a co-operative investigation between the U. S. Geological Survey and the state engineer's office were begun in 1925. This work has been under the direction of A. G. Fidler and S. Spencer Nye, of the U. S. Geological Survey. One of the most important results of the study was the discovery that many old abandoned wells in the basin were permitting the artesian supply to leak into the upper strata. This wasting of the valuable water supply and the usual practice of drilling new wells without regard to the shutting off of the old wells led to state action for conservation.

New Mexico law, which places artesian basins under the jurisdiction of the state, was outlined briefly in *Engineering News-Record*, March 3, 1932, p. 325. In addition to careful control over permits for new water rights in the area, a further regulation, resulting from the authority provided by the act, has been the requirement that existing wells upon any acreage have to be repaired or plugged before permits are granted for drilling new wells. Continuation of this policy, together with the plugging of many of the old abandoned wells in the area, provides the basis for the conservation program.

The recovery in the artesian basin