RAPID RAILWAY TRESTLE BUILDING.

On Oct. 2 and 3 the Chicago, Rock Island & Pacific Railway Co.'s bridge over the South Canadian River, south of Union City, O. T., was washed away and destroyed, except 416 ft. of trestle approach. The bridge before the washout consisted of two combination through truss spans of 155 ft. each, one iron through truss span 130 ft., four deck plate-girders 44 ft. each, and a pile trestle approach at each end, making a total length of 2,222 ft., with an average height of 15 ft. above the bed of the river. The sudden rise in the river was caused by heavy rains over a hundred miles west of the bridge. The first high water, making a wave 6 ft. in height, struck the bridge at 11 a. m. Oct. 2, taking out about twenty pile bents. The crest of the flood reached the bridge about 3 p. m. Oct. 3, reaching a height of 12 ft., and completely washed away the bridge, with the exception of the 416 ft. mentioned above. It also washed away 4,400 ft. of track and embankment south of the bridge.

Mr. A. S. Zinn, principal assistant engineer, thus describes in the Engineering Record the method of rebuilding : Before pile driving could be started at the south end of the river bridge it was necessary to relay the 4,400 ft. of track, and to do this we had to construct a total of 300 lin. ft. of pile trestle across the deep holes washed through the embankment — the shallow places were cribbed up with ties. This 4,400 ft. of preliminary work was started at 3 p. m. Oct. 4, and completed at 6 p. m. of Oct. 6. On the afternoon and night of the latter day, the bridge gangs unloaded material at both ends of the bridge. The following morning, Oct. 7, the pile drivers at each end of the bridge commenced driving piling. The work was continued day and night, and the bridge was connected for traffic at 6 p. m. Wednesday, Oct. 12, making about 129 hours worked by each driver. In this 129h hours one pile driver drove 54 bents of four piles to the bent, and the other 68 bents of three piles to the bent, or a total of 122 bents, with 420 piles. Thirty-five piles were used, with an average penetration of 13 ft. The total length of temporary trestle is 1806 ft. averaging 14.8 ft. to the panel. To accomplish this work in 129 hours each pile driver had to drive at the rate of 1.6 piles per hour, averaging about 7 ft. of bridge per hour.

The organization of forces on each end was two pile driver crews and three trestle bridge gangs, a total of about 36 men on each end, making two working shifts and permitting night work. In addition to this there were two engine and train crews on each end. The pile drivers were 20-ft. extension, with steam turning gear and drop hammers weighing 3,100 lbs.

The method of work was to drive a bent of piles, saw them off, put on the caps and sway braces, lay the stringers, ties and rails, then move ahead and repeat the same work. All material was handled by the drivers, and toward the close it was necessary to run back 1,000 ft. to get material, as beams could not be used. This necessitated running back eight times with the driver for each bent and panel.

Some of the difficult features in connection with the rapid construction of this bridge were the securing of material and assembling of forces. Most of the gangs were small and filled out with new and inexperienced men. Some of the material had to be loaded and hauled a thousand miles in detouring, to reach the bridge, as all the roads crossing the river had more or less trouble. At the local railway material yard at Chickasha, 22 miles south of the river, only enough bridge material was stored to build about 750 ft. of trestle. About one-half of this was used up in building trestle bridges across the holes washed through the embankment south of the river. Only 24 hours' notice of this flood was given, and after the washout the wires were not working for four days, so that work was badly handicapped.

As 150 carloads of material were used in the construction of this bridge, and there was no way of getting the material to the front except to run back with the pile drivers and pick it up, the bridgemen deserve a great deal of credit for completing the work in so short a time.

THE PAINTING OF FIRE ESCAPES.

Cast and wrought iron behave very differently under atmospheric conditions, and require somewhat different treatment. The decay of iron becomes very marked in certain situations, and weakens the metal in direct proportion to the depth to which it has penetrated, and, although where the metal is in quantity this is not appreciable, it really becomes so when the metal is under three-fourths of an inch in thickness. The natural surface of cast iron is very much harder than the interior, occasioned by its becoming chilled, or by its containing a larger quantity of silica, and affords an excellent natural protection ; but, should this surface be broken, rust attacks the metal and soon destroys it. It is very desirable that the casting be protected as soon after it leaves the mould as possible, and a priming coat of paint should be applied for this purpose ; the other coats thought requisite can be given at leisure. In considering the painting of wrought iron, it must be noticed that, when iron is oxidized by contact with the atmosphere, two or three distinct layers of scale form on the surface, which, unlike the skin upon cast iron, can be readily detached by bending or hammering the metal. It will be seen that the iron has a tendency to rust from the moment it leaves the hammer or rolls, and the scale above described must come away. One of the plans to preserve iron has been to coat it with paint when still hot at the mill, and although this answers for a while, it is a very troublesome method, which iron masters cannot be persuaded to adopt, and the subsequent cutting process to which it is submitted leaves many parts of the iron bare. Besides, a good deal of the scale remains, and, until this has fallen off or been removed, any painting over it will be of little value. The only effectual way of protecting wrought iron is to effect a thorough and chemical-cleansing of the surface of the metal upon which the paint is to be applied ; that is,

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