the base of the crane on the side remote from the jib. and the other is in the form of a truck, and can be adjusted to assist the balancing under varying loads. The lower part of the crane is fixed to the revolving table, which has a range of 360 deg. The jib is hinged at the top of strongly-built uprights, and can be adjusted by means of a connecting-link girder attached to a large screw. The centre-pin is of massive proportions, and strongly-connected to the structure of the vessel. The roller-path on which the crane revolves is well secured and bedded to the deck, and strongly supported by bulkheads and girders.

The crane is proportioned for handling a maximum working load of 75 tons at a radius of 51 ft., 60 tons at a radius of 66 ft., and 10 tons at a radius of 72 ft., the minimum radius of the crane being 40 ft. The height of lift is 100 ft. above the water-level when the crane is working at 51 ft. radius.

Four motions are provided—viz., hoisting, derricking, slewing, and ballast adjusting. Two sets of double-cylinder horizontal steam-engines are provided for working the above motions (Fig. 6): one set with cylinders of 9-in. bore by 18-in. stroke for hoisting and derricking, and one set with cylinders at 8½-in. bore by 12-in. stroke for slewing and ballast adjusting. The hoisting-gear consists of three reductions of steel spur-gear. The load is lifted on eight parts of extra flexible best plough steel wire-rope, winding two parts, the drum being grooved right and left hand. Change gear is provided on the hoisting motion in order to give three speeds of lift. The derricking is worked off the second-motion hoisting-shaft by means of one further reduction of spur-gear, one bevel-gear and a large screw, working into a gun-metal nut fixed to a swivelling crosshead attached to the lower end of a steel link, the upper end of which is connected to the back end of the jib.

The crane revolves on a set of live rollers (Figs. 2 and 3). The bottom roller path is a complete cast-steel circle, having teeth on the outside, with which the slewing-pinion engages. The slewing-gear consists of two bevel-gear and two spur-gear reductions (Fig. 6); two speeds are provided.

The ballast-adjusting mechanism includes one bevel-gear and one worm-gear reduction. The travelling counterweights on each side of the crane are racked in and out by means of flat-link chains working on sprocket-wheels.

The crane structure (Figs. 2 and 3) consists of a revolving turntable carrying a double triangular frame, on the apex of which the jib is pivoted. The jib is a lattice structure, having two bottom booms and one top boom, forming a triangle.

The various motions are controlled from the driver's cabin, which is situated in an elevated position in front of the crane. The speeds at which the various motions can be performed are as follow:—

Hoisting.....75 tons at 3 ft. per minute.
" .....25 " 9 "
" .....10 " 20 "
Slewing.....75 tons at one revolution in 4 minutes (slow gear).
" .....10 tons at one revolution in 2½ minutes (fast gear).
Derricking.....From maximum to minimum radius in 8 minutes.

Steam is supplied to the engines at a pressure of 80 lb. from a large vertical boiler situated on the pontoon, with a steam-pipe led up through the centre-pin of the crane.

The pontoon has been fitted with a portable self-contained grain-elevator, which is fitted with a bridle to suspend the apparatus from the hook of the floating crane when required. The grain-elevator is worked by an electric motor, and has a capacity of 80 tons of grain per hour. A dynamo is supplied and fitted suitable for supplying power to the grain-elevator and for the electric lamps with which the pontoon and crane are fitted up. Two powerful arc-lamps are also fitted on the deck of the vessel.

The pontoon has been fitted with a powerful steam warping-capstan, and is supplied with all the usual fittings for this class of vessel, and is also fitted up to fulfil the Board of Trade requirements, a lifeboat and other accessories being supplied.

AWARDS FOR WATER AND WATER POWER DIVERSION

At the convention of the New England Waterworks Association held September 12, 1907, a resolution was passed "that a committee of five be appointed by the president to collect data relating to awards that have been made for damages resulting from the diversion of water; also to consider the practicability of joint action with the National Cotton Manufacturers' Association, or other organizations of mill owners, relating to the formulation of standard rules of computing or assessing damages for the diversion of water."

This committee consisting of Charles T. Main, chairman, Boston, Mass.; Leonard Metcalf, secretary, Boston, Mass.; Richard A. Hale, Lawrence, Mass.; Charles E. Chandler, Norwich, Conn.; William Wheeler, Boston, Mass.; has just rendered its report* which contains valuable information.

In the fundamental data which are given only one series of facts stated is the work of the committee—the computation of the unit basis of award or agreed selling price; that is, the amount thereof "per square mile per foot of fall," or "per million gallons daily per foot of fall."

Why, it may be asked here, did this committee select the unit basis adopted for comparison of the information contained in these circulars?

Direct comparison was impossible for obvious reasons. A comparison of the amount of the awards or the prices agreed upon could not be compared upon a horse-power basis without involving questions as to the character of the use, the hours of use, (whether for 24-hour power, 10-hour power, or any other period), and without the exercise of judgment by the committee or of the experts employed upon the different sides of the case.

For this reason it seemed wiser to the committee to adopt as a standard unit of comparison in these cases, the amount "($) per square mile per foot of fall," or "($) per million gallons daily per foot of fall." These standards are relatively fixed and easy of determination, for there is usually substantial agreement by the experts as to the extent of the watershed involved and the actual available fall.

The summarized results include statements of the total watershed above the damaged property, the amount of watershed from which water was actually diverted, the available fall, the unit prices paid, either per square mile per foot of fall or per million gallons daily per foot of fall, and a few significant remarks, all grouped into four broad classes as follows:

*The complete report will appear in the Journal of the New England Waterworks Association.

(Continued on page 726.)