

braces and folding wedges. Under it were placed three shoes, which slid on inclined launching ways, provided with guides for their whole length.

In October, the crib for the upper draw rest was rebuilt on the south bank of the river, a third of a mile above the bridge ; it measured 31 feet wide, 73 feet long, and  $10\frac{1}{2}$  feet high ; was built of square timber, with cross walls and bottom of round timber and planked on the outside ; the upper end was formed like that of the piers and caissons, and the lower end square, though shelving forwards—this form being thought favorable to a scour beneath ;\* additional buoyancy was secured by binding a number of empty coal oil barrels inside of it. Early in November an attempt was made to launch the crib, but its misfortunes were not yet over, the ways breaking down under the weight and leaving it lying on one side at the edge of the water ; nothing could be done towards raising it in consequence of the rapidity of the current in front of it ; and in this position it remained till the following February. On the 9th of January the ice jammed at the bridge site, and the river for several miles became closed ; a channel was cut in the ice from the bank where the crib lay to its permanent location above the pivot pier ; on the 4th of February it was raised by means of hand crabs, and successfully floated into position ; the water was very low, the current only two miles an hour, and the crib was easily held by lines attached to posts on the shore and to anchors put in the ice. It was sunk by putting on additional courses of timber, and throwing in rubble stone ; the current swept the sand, about 10 feet in depth, away from below, and allowed it to settle firmly upon the rock. As this crib had to be placed in position before the other works connected with the pivot pier could proceed, the difficulties in the way of locating it accurately, with no neighboring anchorage, were very great, and the misfortunes of the launch in October may have been more than compensated by the advantages which the ice gave for handling the crib when it was finally placed. On the 17th of February the ice gave way above the bridge and went out, doing no further damage to the crib than to loosen the upper course of timbers and fill it with ice. Before the close of the low-water season the more exposed parts of the crib were filled with beton, and additional stone was thrown into the central divisions.

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\* The shape of this crib appears on the plan of Draw Protection, Plate VII.