

The state of the dam at Dartmouth was about as shown on the sketch. The ground at the side of the weir had risen by the action of the frost and taken the weir up with it. This left spaces between the planks, and the frost had then made a seam below the water mark, admitting the water, which rapidly wore away the dam.

To repair this temporarily, the lake was dammed off in front of the weir, and the apron in front double planked, breaking joints. The planks were nailed on one side only, so that if the frost raised them again no harm would be done. Each plank would work against its neighbour and always keep a tight joint. Clay was then puddled in front and rammed back as far as possible under the weir. This stopped the leak, and about a week later the wood of the waste weir was taken out, the space filled up, and the weir removed further along to the end of the dam, where it has a gradual fall back to the tail race.

In the spring it is intended to carry the slope of the dam back some 90 or 100 feet, which will give the inside of the dam a slope of about 20 to 1.

The Gate House.—The gate house is set in the front of the dam. The intake ditch is 6 feet wide at the bottom, with side slopes varying from almost perpendicular at the gate house to about 3 to 1 at the outer end. The sides are rip-rapped for the entire length. The ditch runs out into the lake about 125 feet to deep water on a level with the bottom of the gate house. The foundation and wing walls are built of rubble and cement masonry. When the lakes first filled up, this wall was found to leak considerably, so a coating of cement concrete 4 inches thick was put on the inside; this did not stop it, so a similar coat was put on the outside, and this seemed to make the wall tight. After the lakes filled up a second time, however, a slight run of water came out of the end of the waste flume. This leak has not yet been located, but will probably be repaired as soon as the frost is out of the ground.

As will be seen by the plan of the gate house (see Plate—) there are two sets of screens, they are of copper-gauze and set 4 feet apart. The screen frames, as well as the sluices and guide timbers, are made of pitch pine. Some difficulty was experienced at first by these swelling on coming in contact with the water, but after being planed down they gave no more trouble.

The opening in front of the gate house is two feet wide, and runs the whole depth of the wall. This opening is covered with an iron grating to prevent sticks, loose ice, etc., from coming in contact with the screens.

The waste sluice at the back of the house, which may be used to drain off the lakes, is built 3 ft. high and 2 ft. wide; it is made of 6 in. x 6 in. hemlock, fastened together with rag bolts, and braced inside every 6 ft. The bottom floor is 8 ft. 9 in. below the high water level of the lake, and the top of the town supply pipe is 6 ft. 2 in. below the water level.

THE MAIN PIPE LINE.

The main pipe from the lakes to the town is 12,600 ft. long. It starts from the gate house with 20 in. pipe, which continues for about half a mile, where it is reduced to a 12 in. which runs a distance of 9,300 ft. to the town. In the line, there are 3 blow offs and 3 air cocks. For a distance of 800 ft. just before the end of the 20 in. pipe there is a hill rising above the lake level; this had to be cut through to a depth of 23 ft. in order to get the pipe down to grade. At a place 1,300 ft. from the lake the trench bottom was found to be too soft to lay the 20 in. pipe on; so a platform of 2 in. plank was built for a distance of some 75 ft.

At the upper canal bridge (see Map, Plate II.) the 12 in. pipe is reduced to a 10 in., and a special left to take an 8 in. pipe down Portland st., to the lower canal bridge, thence across the bridge, to connect with the 6 in. pipe at the corner of Portland st. and Wilson lane. This pipe will serve as a safeguard in case of the water having to be turned off the 10 in. pipe at present supplying the town.