

EMPTYING.

Eight minutes are required to empty the lock.

The water in passing out of the lock goes down through a well which is covered with a grating, thence through two short culverts and up through a well below the lower lock-gates.

The emptying valves, through which the water escapes from the lock, are two in number and are located in the well just above the lower lock-gate. Their construction is similar to that of the filling valves, just described. Each culvert is complete in itself. If an accident should occur to one culvert, or to its valves or engines, the other culvert could still be used.

MACHINERY.

The power is obtained from two 30 inch turbines. The computed effective energy of the two wheels combined is 50 horsepower. Water is brought to them through a supply pipe from the canal above the lock. Both are connected by spur gearing to the main shaft. The power for operating the different parts of the machinery is taken from this main shaft by means of pulleys and belts in the usual manner. Two pumps force water into an accumulator loaded so as to give a pressure of about 120 pounds to the square inch. Water is taken from the accumulator to the engines which open and close the gates and valves. Heavy West Virginia mineral oil is used in the cylinders whenever the temperature is so low that water would be likely to freeze. There are four gate engines, one for each leaf of the upper and lower lock-gates, and four valve engines, one for each of the filling and emptying valves.

The machine house is of stone. There is a cellar, ground floor, and upper floor. The main shaft, accumulator, pumps, &c. are on the upper floor; the pen-stock, dynamo, cool-room, etc. are located on the ground floor. The accumulator passes from the cellar up through the upper floor.

The turbine iron supply pipe lies on the south side of the