

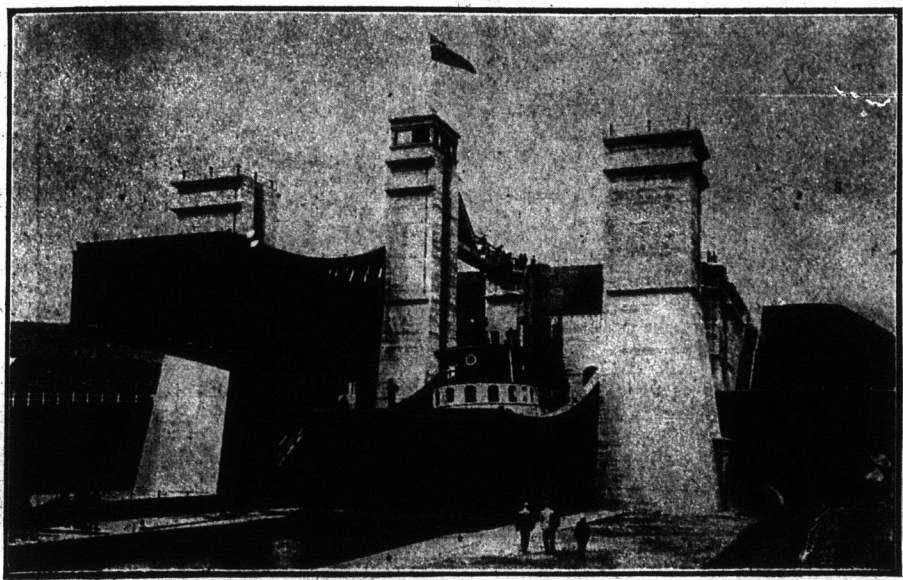
The Peterborough Lift Lock.

The next time you step into the druggist's take a good look at his scale as he weighs you out your three ounces of pickling spice. You will then have a pretty good idea of the working of the huge Peterborough Lift Lock—the big feature of the Trent Canal which is to cut 500 miles off the grain route between Port Arthur and Montreal.

Imagine each one of the scale pans magnified to an enormous rectangle 140 feet long, 33 feet wide and 9 feet 10 inches deep—each resting on a cast iron cam—hollow but with a solid bottom—7½ feet in diameter. When the extra weight forces one side down—as the

feet above the first and from the opposite direction. On a level with the lower stretch rests one of the big iron chambers or pontoons with the southern gate open to admit a boat coming toward it up the canal. High in the air, just the width of the tower, to one side, is the other pontoon—its iron support in full view but resting only on the water in its press. The northern gates of this pontoon are slowly dropped under the water and a boat coming down the canal sails over them into it.

Both boats are then made fast to the sides of the pontoons with ropes so that there shall be no moving in the pontoon.



Peterborough Lift Locks.
Showing boat lifted from lower to upper level.

druggist's placing of the three ounce weight does—this ram plunges 65 feet into an iron press sunk 75 feet into the solid rock. Both rams and presses are built of cast iron a little over three inches thick, made and erected in sections. The presses are just enough larger than the rams to allow a space all around between the two of 1½ inches. This space when the ram is inside the press is filled with water which furnishes all the motive power for the lock.

In place of the long bar connecting the bases on which our small model pans rest there is in the lift lock a 12-inch iron pipe connecting the two presses. In the centre of the pipe is a valve which when closed makes each side entirely separate and this valve is controlled by a lever in the tower built high over the lock.

The pans of this scale being so enormous and unwieldy it was necessary to have some scheme to make them run straight when they make their 65-foot journey into the air. So they go up each between two towers—the middle one doing duty for both sides so that there are but three towers. On the top of the middle tower is built a glass enclosed room in which are all the levers which control the mechanism at once so powerful and so simple.

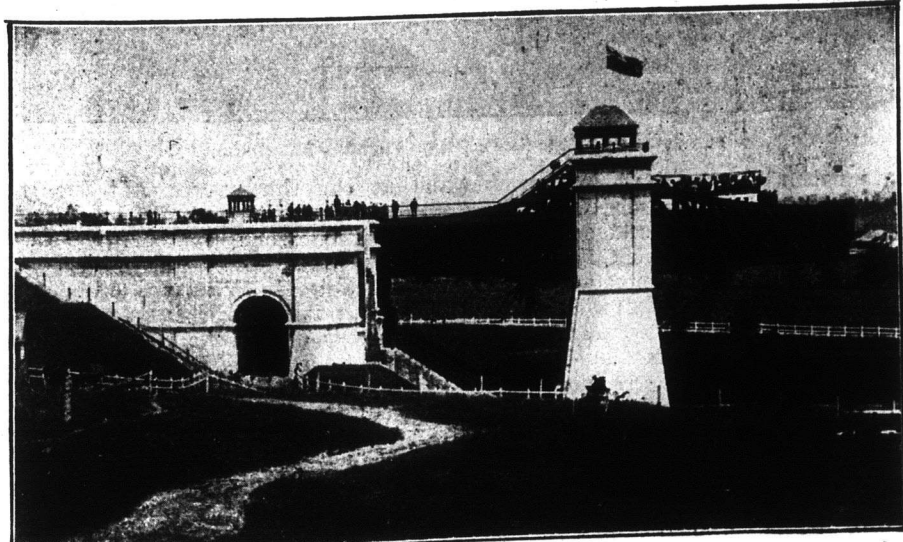
To understand the lock in operation, one must imagine a stretch of canal terminating abruptly at the big concrete embankment of another stretch which comes to this embankment 65

All that keeps the waters of the upper reaches of the canal from making a picturesque but death dealing descent to the lower stretches—or the big boats from making a similar drop—are the gates at the exposed end and no chances are ever taken on the boats knocking those gates out. There are also elaborate devices for making the gates themselves secure and water tight.

The upper pontoon is always placed at such a level that the water in it is ten inches deeper than it is in the lower one. This is enough to play the part on a large scale of that three ounce weight. Everything is then ready for the man in the tower. He opens the valve in the cross pipe before described. There is then a passage for the water from one press to the other. The heavier pontoon now presses so heavily upon the water under it that that water is forced to do something. The only thing it can do is rush over into the other press where there is less pressure. The pressure of the water under the other pontoon becomes heavier than the pressure on it and in consequence the water forces the other pontoon up. So you have the whole secret.

The pontoons move so easily that unless one is watching one may easily go all the way up without being aware of any movement. They work rapidly, too—the whole process from the time a boat comes to the pontoon till it is safely out being about seven minutes.

Of course, there are many interesting



Peterborough Lift Locks.
Showing boat lowered from upper to lower level.

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details and devices for controlling the gates and the various valves and for generating the power to operate them. These one may see by a damp, dark journey into the bowels of the concrete structure which forms the basis of this lock. In the Peterborough lock, which is much the largest in the world, all the work is of concrete. But at Kirkfield, where there is the second one on this canal—having only a 48 foot lift as against 65 at Peterborough—the works are all of steel though the principle by which it works is precisely the same.

Of course the great value of such a lock as this is as a time saving device. Under the ordinary system of locks it would take at least four locks to replace this one and the best a boat could hope to do would be to spend an hour getting through them. Further the lift lock takes a boat up and down at the same time which the other locks cannot do. So that it can do two hours' work in seven minutes.

It cost about half a million dollars to build this lock but in accordance with the government's general policy for its canals there are no tolls whatever.

Browning and His Servants.

On a certain day Browning met one of his servants, whose joy it was to wait upon him, carrying a rather heavy basket of grapes and other fruits on her arm.

"Oh, Giuseppina," he cried, "Let me help you!"—and seized the basket suddenly from her hand.

The woman, overwhelmed by such condescension, protested, "Troppo onore, signore."

"Nonsense!" said the poet. "You are always helping me; won't you allow me for once to help you?"

Still the woman resisted, saying—"It is not for such as you, O signore!" This was more than he could bear.

"We are all made of the same clay, Giuseppina"—and, gaining his point—for who could withstand his will?—he held one handle of the basket until they reached the palace door.

This same worthy woman is fond of relating a story of her master which illustrates another side of his character. He had paid her weekly account, and there remained one centesimo as change. The woman showed the little coin, saying shyly—"I cannot offer this trifle to the signore."

"Yes, my good Giuseppina," he said, taking it from her hand; "it is one thing to be just and another to be generous; you do right to return it."

"And not long after this," continues the woman, "he made me such a grand present."

Had a Trouserless Home.

An old woman from the country bought three boxes of matches from her grocer in town. It rained when she was going home, and the matches became so damp that not one of them would strike. On the following Saturday she took the matches back to the grocer, and upbraided him for selling such useless stuff. The grocer took out one or two, and struck them quite easily on the leg of his trousers, for by this time the matches had become perfectly dry. But the old woman did not think of this explanation, and exclaimed: "Tut tut, that's not good enough for me. I can't tramp six miles to your trousers every time I want to strike a match. Give me three boxes of a kind that I can light at home."