

The communication is accompanied by a drawing, No. 3477, showing the elevation and section of the wheel.

Mr. Albano stated, that having been called to Lombardy in the year 1840, for the purpose of erecting a mill for spinning and weaving flax, he selected a spot at Cassano d'Adda, where he found a stream of water, which at that time could only drive two pair of corn-mill stones, and two saw frames, each containing two long perpendicular saws. He conceived that this power might be employed more advantageously by improving the water-course, and had succeeded eventually in enabling it to give motion to upwards of six thousand spindles, and a number of power looms. For this purpose he designed the general plan of the mill, and of the water-wheel which had been described, and had intrusted its execution, with other parts of the millwright work, to Mr. Fairbairn, adopting, at his suggestion, the ventilating principle for the buckets, which had proved very advantageous. In the ordinary form of buckets, the air not being able to escape, prevented them from being filled, and thus the power of the wheel was diminished. For the purpose of avoiding that loss of power, Mr. Albano had originally designed the top of the feeding cistern to be cast of an open pattern, so as to allow the air to pass away freely, but that plan had been partially superseded by the ventilation of the buckets.

The drawings did not show, what he considered an important improvement, in the method of governing the opening of the breast-shuttle. Mr. Fairbairn's usual plan was to have a shaft across the feeder, with a chain attached to the rack, and a heavy balance weight suspended from it over the water. Mr. Albano had modified this system by introducing gearing, and a second motion, with a supplementary shaft extended into a vault beneath the mill; a much smaller balance weight thus regulated the movement of the shuttle with great ease, and it was so delicately balanced, that on one set of spindles being stopped, it was immediately perceived from the action of this governor.

Mr. Fairbairn's usual practice was, to make the periphery of his wheels move at a velocity of from 4 feet to 5 feet per second for low falls; but Mr. Albano had increased the velocity of this wheel to 5·25 feet per second, which he found to be very advantageous, and more convenient for driving machinery, which was required to attain a very high velocity. He found the effective work of the wheel to be about 0·60 of the water expended.

Mr. Mallet had found that the co-efficient of the majority of the wheels constructed in this country, was between $\frac{3}{10}$ ths and $\frac{1}{10}$ ths. Mr. Mallet.

Mr. J. Taylor. Mr. Taylor said, that in the session of 1842, he had given a statement* of the average performance of a number of wheels, employed in pumping from some mines in Devonshire, and it was found to be 63·3 per cent.

Mr. Glynn. Mr. Glynn stated, that the general work of good overshot wheels, might be taken at $\frac{2}{3}$ rds of the water employed to turn them, supposing that the water was required to be raised again to its original level. This included the friction of the pumps, rods, &c.

No. 613. "Description of a Water-Meter." By P. Carmichael, (Dundee).

Water-Meter.

This meter is stated to have been used for some time, for the purpose of supplying the three steam boilers of an engine of 80 horse power, and by it, the evaporative powers of the boilers, which were of different forms, and the value of various kinds of fuel, have been carefully tested.

Its action is thus described ; within a closed box which will contain 50 gallons of water, a copper float is placed, so as to move up and down freely, on a hollow spindle between two stops ; by means of levers and a spanner, which are acted upon by the float, two conical valves are alternately opened and shut, as the box is required to be filled, or its contents to be allowed to pass to the boiler. The float ascends above the top, and descends below the bottom of the box, in cavities arranged for the purpose, by which means, only a given quantity of water is passed through the box at each descent of the float. It is found by practice, that each discharge contains exactly the same quantity of water.

The communication is illustrated by three detailed drawings (Nos. 3524 to 3526,) showing the construction of the machine.

No. 665. Mr. Wertheimber exhibited several modifications of the "Automaton Calculator," invented by Dr. Roth, and exemplified their practical use, by performing with great rapidity, calculations in all the simple arithmetical rules.

Calculating Machines.

The machine for performing addition, multiplication, and subtraction, consists of a narrow oblong box, with a metal plate on the top, which is divided into nine indexes, and semicircular notches ; the first six, from left to right, serve for the numbers, from hundred thousands to units ; the three last are appropriated to shillings, pence, and farthings. Round each index are engraved figures, from 0 to 9, and the semicircular notches contain teeth, which correspond with the

* Vide Minutes of Proceedings, 1842, p. 97.