other pieces of mechanism, for *verifying* or ensuring accuracy in the results. Lastly, there are snail-pieces on the axes of some of the wheels; levers to be acted upon by these pieces to ten different heights, according to the numerals; sectors at the other ends of the levers—ten punches in each sector, having the raised character of the ten numerals; a bent lever which acts upon a particular punch in a particular position of the sector; a copper plate on which the punch may make an indented impression; levers for moving the plate while another punch is coming into action—these are for *printing* the results."

The interior mechanism of the calculating machine—or "Difference Engine," as it is termed by its inventor—is so admirably contrived and adjusted, that the instrument cannot go wrong in its operations. Were an error to arise, the friction of one part of the machinery upon another would adjust it—or, if the error were serious, cause the machine to come to a stand-still.

Although this great and wonderful machine has never been carried to completion, it has given rise to several of less power constructed on the same principle. One of these, perfected by a Swede, is in use at Somerset House. Another was exhibited in the London International Exhibition of 1851, by a Polish Jew named Staffell, and was a very beautiful little specimen of mechanical ingenuity and power.

Mr. Babbage, we must add, has for many years been labouring upon a machine of a still higher kind than that mentioned here. This machine he has termed the "Analytical Engine," and it is intended to execute the processes of algebra and other branches of the higher arithmetic. It appears that the endeavours of the inventor to bring the plans of this instrument to perfection have been attended with marked success. We trust, but scarcely anticipate, that he will live to see both engines carried nto practical execution.

THE COTTAGER'S HOME.

CHAPTER XX.

JAMES BRINDLEY AND CANALS.

ALTHOUGH not the inventor of canals—who shall point out the inventor?—James Brindley, the celebrated engineer, is so intimately associated with their development in England, that we can select no better representative of this important branch of inland communication.

James Brindley was born in 1716, in the parish of Wormhill, Derbyshire. His parents were very poor, and altogether illiterate, and their son enjoyed no educational advantages. Indeed, to the end of his days he could only read with difficulty. At the age of seventeen he apprenticed himself to a millwright residing at Macclesfield.

"In the early part of his apprenticeship," says the writer of his life in the "Biographia Britannica," "he was

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