

FREE POWER FROM RYDE FOR EVER

George Singleton Hill and his Waterwheel

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In the Isle of Wight Record Office at Newport is a well-preserved official document still complete with its seal. The opening lines of which read:

LETTERS PATENT to GEORGE SINGLETON HILL of Ryde in the Parish of Newchurch, in the Isle of Wight, in the County of Southampton, Miller, for the Invention of "IMPROVEMENTS IN HYDRO-PNEUMATIC MACHINERY"



There is no surprise in ‘*the Parish of Newchurch*’ and ‘*the County of Southampton*’ being included in the formal greeting as it was sealed on the 7th December 1858 long before the Isle of Wight became a County in its own right and before Ryde was its own ecclesiastical parish. Perhaps there is nothing unusual either in it showing signs of having been hung on a wall as most inventors are proud of their innovation and most want their ingenuity to be recognised. Just what were the improvements to pneumatic and hydraulic mill machinery was not at first clear as the detailed specifications which are the legal and technical heart of any patent were not preserved with the formal document.



Since the opening of the British Library next to St Pancras Station and Hotel on the Euston Road in London, all British patents are stored in the building. A search revealed that the petition to the Patent Commissioners was left on the 2nd August 1858 and the Letters Patent were sealed at the end of the year on 2nd December as number 1743 for the year 1858.

Below is the petition with the provisional specifications. The Letters Patent have a slightly longer format and are complete with drawings

I, **GEORGE SINGLETON HILL**, of Ryde, in the Parish of Newchurch, in the Isle of Wight, in the County of Southampton, Miller, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN HYDRO-PNEUMATIC MACHINERY**," to be as follows:-

It is based on the principle that atmospheric air will sustain a column of water varying from twenty-eight to thirty-two feet in height, according to its pressure, as indicated by the barometer.

The machinery to consist of a water wheel of about twenty-eight feet in diameter, a cistern of about three feet in depth to be made underneath it, a tank not less than three or four feet in depth to be fixed above the water wheel, in such a position that the bottom of the tank shall be level with the top of the water wheel. This tank to have an aperture at the bottom, to be fitted with a sliding hatch to open parallel with the buckets of the water wheel, for the water to flow through, there will then be fitted to this tank as many pumps as are intended to be used according to the power required for pumping the water from the cistern below into the tank above, and which are to be worked by the water wheel. The machinery being thus constructed, and the cistern and the tank being filled with water, it is set in motion by opening the aperture at the bottom of the tank, when the water will rush through into the buckets of the wheel with considerable force, and thus give it a continual motion. The pumps being worked by the water wheel, will bring into the tank about five times the quantity of water required for working themselves, which can be made available for driving any machinery required. The cistern and tank being once filled, can be worked for any length of time, as the water after being emptied from the wheel into the cistern, will be pumped into the tank, to be used over and over again. The speed can be regulated by the slide at the bottom of the tank, and if more water should be brought up than should be required to be used it could be returned into the cistern by being allowed to run over the tank into the cistern through a tube fitted there for the purpose. The machinery can be made of any power required, by increasing the number of pumps and the capacity of the buckets in the water wheel for receiving the water, but the diameter of the wheel must not exceed twenty-feet, unless a breastshot wheel is used.

Two illustrations were provided by George Singleton Hill:

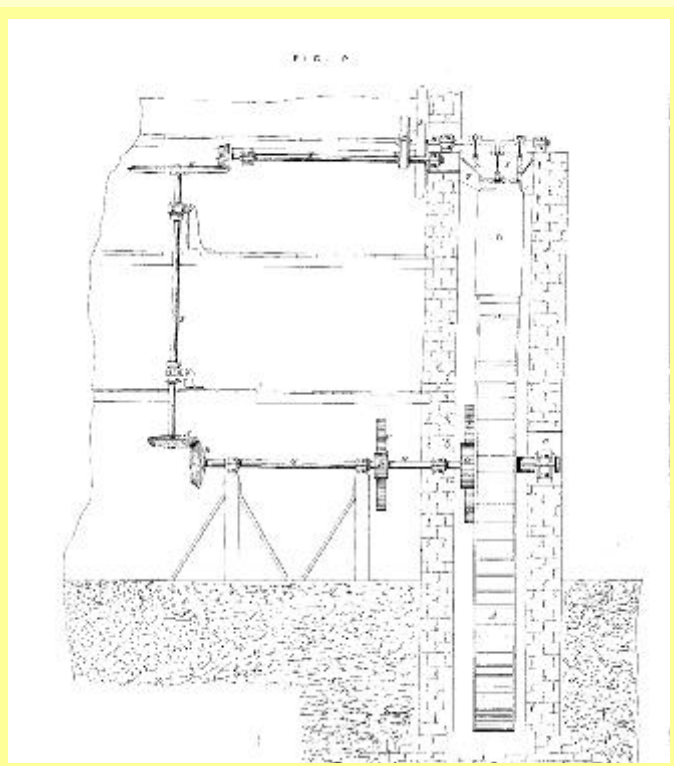
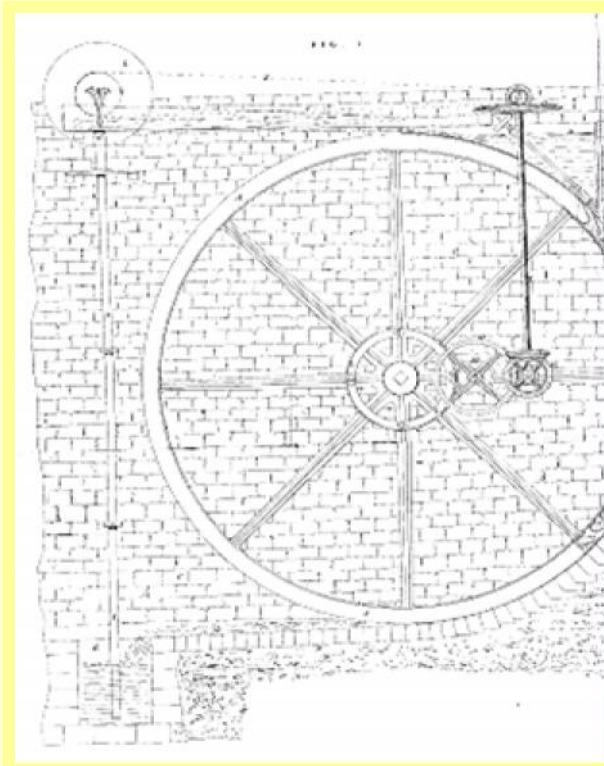


Figure 1, seen on the left below, shows an overshot waterwheel. Driven by gears and shafts from the hub of the wheel are pumps that are located in the top left hand corner. The function of these pumps is to lift the sump water that has already gone over the wheel back up to the top again. Figure 2, on the right, shows the same arrangement but seen from facing the edge of the wheel. The pumps are situated on the right above the wheel. Also visible is the gearing and shaft mechanism for driving them but the pipe for lifting the water back up to the pumps is hidden.

What back in 1858 George Singleton Hill had described is what nearly every youngster, and perhaps very many adults, would like to do – invent a perpetual motion machine! – for he says:

My said invention is based on the principle that atmospheric air will sustain a column of water varying from twenty-eight to thirty two feet in height, according to its pressure as indicated by the barometer ---- The machinery which I propose to employ in carrying out my invention consists of a waterwheel of about twenty-eight feet in diameter, a cistern or well to be made underneath it, and a tank not less than three or four feet in depth to be fitted above the waterwheel - --- There are to be fitted to this tank as many pumps as are requisite, according to the power required for the purpose of pumping water from the cistern or well below into the tank above ---- The pumps being worked by the waterwheel, will actually raise more water than will be required for working the wheel, which surplus may be made available for driving any machinery required ----”

There can be no doubt that George Singleton Hill knew very well that the last statement above is not true. For after all he was the manager, perhaps even a partner in the ownership,

of the then state of the art steam rolling mills which used to stand on the north side of Green Street in Upper Ryde. The mill was where the Salvation Army hostel is now situated. It is true that air pressure will balance a column of water of about the height he stated but only when a vacuum is established above it, as in a mercury barometer. With the system he intended using the atmospheric pressure on the inlet and outlet sides of the pumps are equal so giving no advantage in the lifting of the water. As an engineer running a then modern steam plant in 1858 he would certainly have had some idea of what is now known as the *Second Law of Thermodynamics* – which in lay jargon states ‘*you don’t get anything for nothing*’ – or in other words perpetual motion is just not possible. So why did he go to all the expense of preparing and getting this patent? It has been suggested that he might have spent as much as up to three thousand pounds at today’s prices.



The Steam Mill was roughly where the red brick building between the two white ones is situated

Two possible reasons for his outlay come to mind. The first is that he took part in what might be called ‘vanity patenting’; just as today vanity publishing, often at great expense to the author, is undertaken. A second motivation is perhaps far more the likely. He wanted to take the ‘establishment’ for a ride and have a laugh at it by getting his Letters Patent for a perpetual motion machine. Hence signs that the Letters Patent were hung on a wall. Nowadays a much more rigorous statement of the principles involved is demanded in the patent specifications and in proving that the ideas and concepts developed are original.

Did George Singleton Hill try to see just what he could get away with? Even today, the waterwheel, as illustrated in his specifications, is often one of the examples schoolchildren still use to try and convince someone they expect has less scientific knowledge than them that perpetual motion can be achieved. Sorry but ‘*free power from Ryde for ever*’ must remain a pipe dream. But it would be nice to know just why he put in this patent application.

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