

The river, at the place & time of measurement - 13885 cubic ft. of water per minute. I found it impracticable to make the measurement in the old flume or at the dam, owing to the large quantity of water leaking through the dam. I would suggest that one of the first improvements should be the tightening of the dam. 13885 cubic ft. of water per minute, used under a head of 11 ft. yield  $288\frac{24}{100}$  theoretical horse powers 75 per cent of which gives  $216\frac{25}{100}$  working horse powers, & allowing one half of a working horse power to grind a barrel of flour in twenty four hours we have available power to grind  $432\frac{1}{2}$  barrels in twenty four hours.

13885 cubic ft. of water per minute used under a head of 12 ft. yield  $314\frac{56}{100}$  theoretical horse powers 75 per cent of which gives  $235\frac{72}{100}$  working horse powers & allowing  $\frac{1}{2}$  of a working horse power to grind 1 barrel of flour in 24 hours, we have power to grind  $471\frac{8}{10}$  barrels in 24 hours.

13885 cubic ft. of water per minute used under a head of 13 ft. yield  $340\frac{77}{100}$  theoretical horse powers, 75 per cent of which, gives  $255\frac{57}{100}$  working horse power allowing  $\frac{1}{2}$  of a working horse power to grind a barrel of flour in 24 hours, we have power to grind 511 barrels in 24 hours.

13885 cubic ft. of water per minute used under a head of 14 ft. yield  $366\frac{98}{100}$  theoretical horse powers, 75 per cent of which, gives  $275\frac{235}{100}$  working horse powers, & allowing  $\frac{1}{2}$  of a working horse power to grind a barrel of flour in 24 hours, we have power to grind  $554\frac{1}{2}$  barrels in 24 hours.

In the foregoing calculation it will be observed that only 75 per cent of the theoretical power due to a head the water under the head is reckoned as available for actual work, though most of the manufacturers of first class turbine water wheels claim that their wheels will give an available power for work equal to from 80 to 85 per cent of the theoretical power due to the water under the head.

It will also be observed that the power required to make a barrel of flour in 24 hours has been considered as  $\frac{1}{2}$  of a working horse power, though in many of our first class mills it has required