B_1, B_2, B_3, ... B_{n+1}, the points at which the respective strings are attached to the straight bar which carries the weight W. Number the strings 1, 2, 3, ... according to the pully over which each passes.

The tenison of each separate string is the same throughout.

The weight supported is the sum of the pressures of the strings at B_1, B_2, B_3. ...

The tension of (1) is P, and this is the pressure at B_1.

The weight supported at A_2 is double the tension of (1) and $= 2P$, and this is therefore the tension of (2) and the pressure at B_2.

The weight supported at A_3 is double the tension of (2) and $= 2(2P) = 2^2 P$; and this is therefore the tension of (3) and the pressure at B_3.

Proceeding in this way we obtain the tension of the $(n+1)$th string and pressure at $B_{n+1} = 2^n P$.

Taking the sum of all these pressures,

$$W = P + 2P + 2^2 P + \dots\dots + 2^n P$$
$$= (2^{n+1} - 1) P,$$

and the mechanical advantage is $2^{n+1} - 1$.

Pullies supposed heavy.

Cor. The weights of the pullies may be taken into account by observing that each may be considered as a power acting by means of the string from which it hangs, and supporting a weight on the system of moveable pullies above it.

Let w_1, w_2, w_3, ... w_n, be the weights of the pullies, blocks included.

The weight supported by w_1 on $(n-1)$ moveable pullies is $(2^n - 1) w_1$.

"	"	w_2 on $(n-2)$	"	"	$(2^{n-1} - 1) w_2$.
"	"	w_n on 0	"	"	$(2 - 1) w_n$.
Also "	"	P on n	"	"	$(2^{n+1} - 1) P$.