Here the mechanical advantage is 2.

Cor. 1. If one end of the string be attached to a fixed point, the same result holds good, for the tension must be the same throughout.

Cor. 2. If the weight w of the pully, including the block, be taken into account, it may be supposed attached to the block, and we have

$$W + w = 2 P.$$

65. *First system of pullies.* First system Fig. 7.

A number of pullies are attached to the same block, which supports a weight, and the same string passes round all the pullies.*

The portions of the strings between the pullies are supposed to be parallel, and will therefore also be vertical as in § 65. Let P be the force applied to the string; P will then be the tension throughout, and the weight W is supported by as many parallel forces, each equal to P, as there are parallel portions of the string at the lower block; and the number of these portions is evidently double the number of pullies at this block. Hence, if n be the number of moveable pullies,

$$W = 2 n P;$$

and the mechanical advantage is $2 n$.

Cor. If the weight of all the pullies within the lower block be w, the weight of the block also being included, we may suppose this weight attached to the block, and

$$W + w = 2 n P.$$

67. *Second system of pullies.* Second system. Fig. 8.

Each pully hangs by a separate string, the last pully supporting the weight; the free portions of all the strings are parallel, and therefore vertical.

Let A_1, A_2, A_3,... be the pullies, n being the number of them; W, the weight supported at the last one; P, the power applied at the first string. Number the strings 1, 2, 3,... according to the pully under which each passes. The tension of each separate string is the same throughout.