Title: The Theory of Gearbox

Abstract: The article aims to present a brief introduction to my theory of gearbox

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Article:
Let say we have a gearbox of total ratio 1:4 , and we have input acceleration of a and output acceleration of A , then :
$A=0.25a$
$F=4f$

So why the acceleration decreased but the force increased ?

When mass m on the input gear exerts force on mass M on the output gear through a gearbox for speed reduction of ratio say 1:4 , then the reaction of mass M on mass m is smaller than if they exert force on each other by a normal contact at a normal contact force exerted by mass m on mass M equals reaction of mass M on mass m, but in the case of gearbox the reaction is smaller than the force exerted .

Because inertia and resistance of mass M is small mass m will have the opportunity to exert more and more force making F bigger than f, if the ratio is 1:4 as above then $F=4f$.

And because the inertia and resistance of mass M is small , in gearbox contact mass M tends to absorbs motion than to reflect it , when absorbing motion , mass M tends to not to move from its position making motion little and acceleration small , but when reflecting it in case of normal contact it will again reflect and hit mass M making it move faster and with larger acceleration.