Harvesting energy from Gravity - Short version

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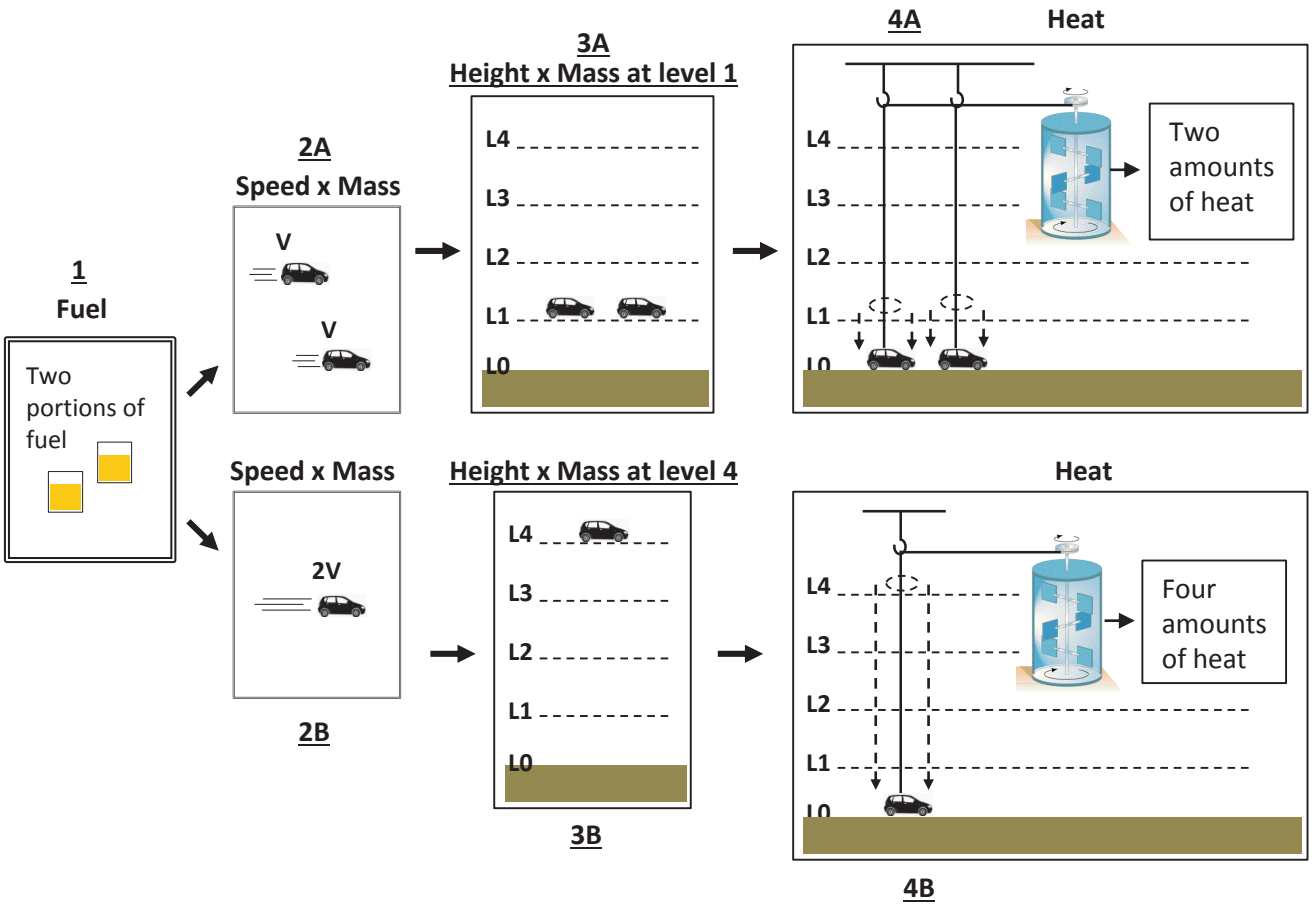
Abstract
Resorting only to simple and incontrovertible effects, this work intends to demonstrate that a given vertical length can be ascended or descended requiring or yielding different amounts of energy. From that, the first conclusion here is that to harvest energy from gravity is not only possible, but immensely simple.

The sole objective of this paper is to demonstrate that there is more than one way to go up and to go down, *on the point of view of energy*. Graphical examples are presented, in which a certain form and amount of energy is converted *into alternative amounts* of another form of energy, depending on how the test-bodies go up and come back down. The absence of mathematics is deliberate and was carefully implemented, for I see the electing of one equation in which energy is proportional to the speed, to make sense of one isolated situation, and the electing of another equation, in which energy is proportional to the square of the speed, to make sense of another isolated situation, as exactly the recipe to go into the old pitfall and not see the fundamental issue. Please consider the invitation I now make to leave mathematics aside for a few minutes; there's no need to make classifications as 'momentum', 'kinetic energy', 'work', and doing so might only hinder. Just use known experimental results, and logic, to judge the soundness of the chains of conversions, and you will see energy appearing.

Example #1- From two portions of fuel, to two amounts of heat*, or four amounts of heat*



Frame **1** – Energy in the form of 'two portions of fuel'.

Frame **2A** – To each one of two cars, one of the portions of fuel was applied. The cars accelerate horizontally converting the fuel into 'speed x mass' (momentum), and the speed they reached gets called 'V'.

Frame **2B** – The two portions of fuel were applied, in this case, to a single car, which converted it into reaching the speed 2V.

$\Rightarrow$ This assumption, that the car which received double the fuel will reach double the speed, is paramount to the idea advocated in this paper. It is supported by F=MA, by Galilean relativity, and specifically verified by data from rocket-engine powered vehicles, in which we can see constant acceleration throughout the tests, meaning that equal portions of fuel get converted into equal amounts of speed variation / momentum.

Frame **3A** – The car's speed is converted to height (by mean of an unrepresented curved ramp), and the height they both did reach gets called 'H' ('Level 1')

Frame **3B** – The speed of the lone car is also converted to height, and it reaches 4H.

$\Rightarrow$ The body with the double speed reaching the quadruple height is a basic experimental result.

Frame **4A** – At the highest point they reached, the cars are attached to an apparatus that converts motion into heat (Joule machine) and are let to descend, one after the other, untill ground level. The amount of heat that their descent generated gets called 'two amounts of heat'.

Frame **4B** – At the quadruple height, Level 4, the lone car is attached to an apparatus that converts motion into heat and is let to descend until ground level. Since the height from which it initiated its descent is four times greater than the height from which each of the two cars of frame **4A** initiated theirs, it will stir the machine for twice as long, and generate twice the heat - 'four amounts of heat'.

Conclusions

Frame **4A** and frame **4B** present energy of the same form, but in different amounts (and there's no fuel, speed, or height anywhere anymore). Since those result from the conversion of the same initial amount of energy, some energy has to have disappeared in the first case, or some energy appeared in the second case, *given by gravity*. The last conclusion, naturally, is the one this paper advocates.

The validity of F=MA (which implies fuel requirement proportional to the speed gain), and the experimental proposition of a body being able to climb to a height proportional to the *square* of its speed, *already suffice in determining that it is possible to harvest energy from gravity.*

Harvesting energy from gravity seems to be as simple as sending a heavy body up in an energy economical fashion, and bringing it down in a fashion that yields more energy. The best way to send a body up and the best way to bring it down, in order to harvest energy, are the ones represented in example 01: The most economical fashion to send a body up is to launch it – directly / in one go / the shorter time-length method. And the fashion that yields the most energy seems to be to attach it to an apparatus and let it descend slowly, because any other method would give a faster, more direct descent.

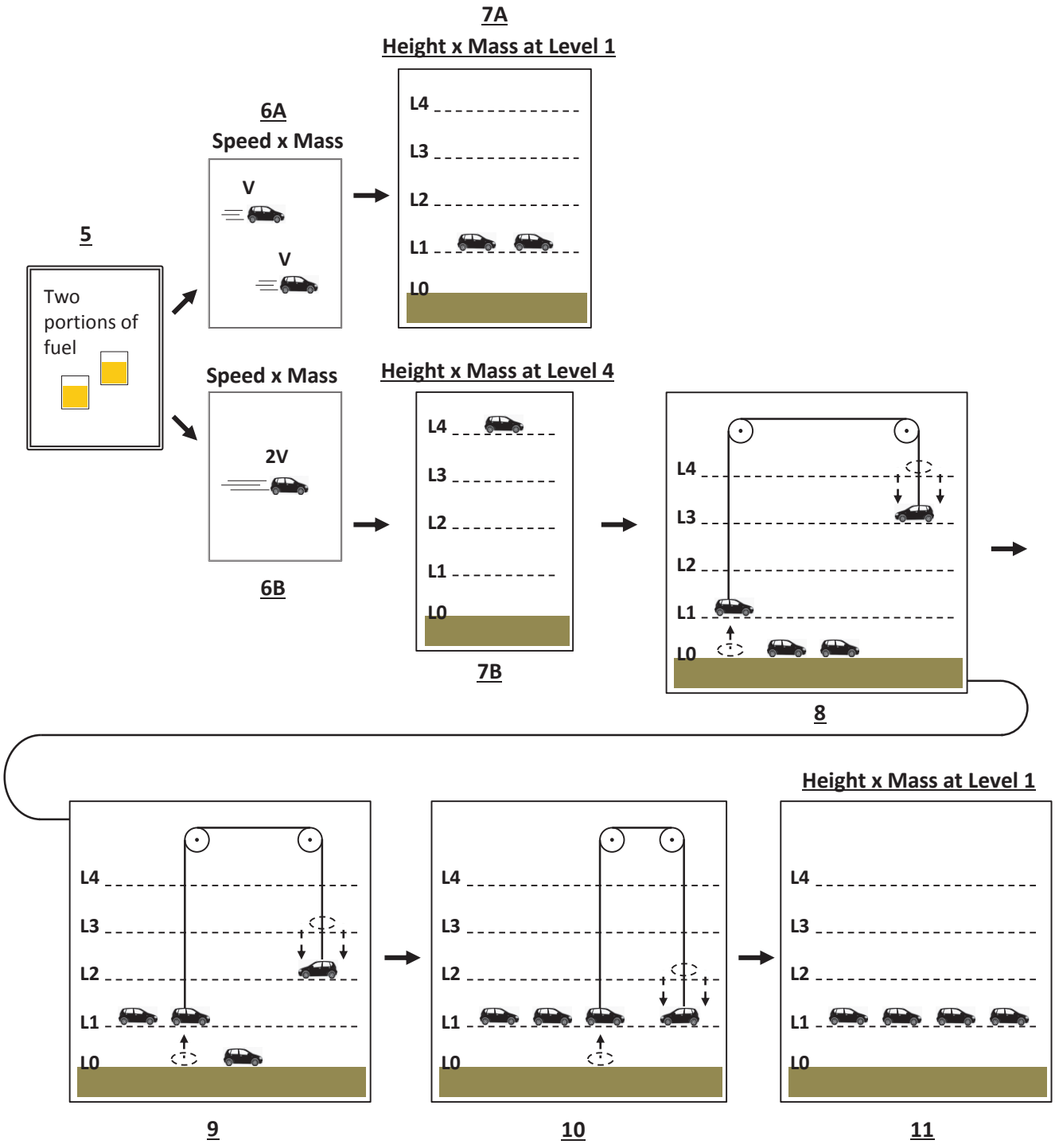
Though obvious, let the statement figure here, that if a test-body is launched up in one go but then is let to fall directly, or if the test-body is hoisted up by a crane and then let to descend while powering an apparatus, there will be no energy discrepancy between ascent and descent.

The energy discrepancy ratio, between launch up in one go and then let fall while powering an apparatus, *increases with the height (vertical displacement)* in the experiment.

It is a conclusion of my endeavours, that the energy of a moving body is *never* proportional to the square of the speed. If a body climbs to a height proportional to the square of its speed*, that is because of gravity's characteristics*, and not due to the energy of the moving body being proportional to the square of its speed ('distance', except when distance means height, *has nothing to do with energy*). However, this subject is not going to be explored here; the sole mission of this paper is to expose and convey, as clearly as possible and with nothing else to distract, the idea that "there's an energy balance fundamental issue" – "there's something fundamental in need of enlightening". In the extended/original version of this paper also the implications to gravity's nature, and the historic and present contexts, are explored.

The following examples #2 and #4 are just small variations of example #1. Example #3 is different; It compares, on the point of view of energy dissipation, the falling in multiple steps, with the accelerating horizontally in multiple steps using rocket-engines, to, once more, expose how different ways of performing a descent *involve different amounts of energy*.

Example #2- From two portions of fuel, to two masses at a certain height, *or four masses at the exact same height* ('Height exchanging')



Frame **5** – Energy in the form of 'two portions of fuel'.

Frame **6A** – To each one of two cars, one of the portions of fuel was applied. The cars accelerate horizontally, converting the fuel into 'speed x mass' (momentum), and the speed they reached gets called 'V'.

Frame **6B** – The two portions of fuel were applied, in this case, to a single car, which converted it into reaching the speed 2V. (* The justification for this conversion can be found in page 2.)

Frame **7A** – Both car's speed is converted to height (by mean of an unrepresented curved ramp), and the height they did reach gets called 'H'.

Frame **7B** – The speed of the lone car is also converted to height, and it reaches 4H.

Frame **8** – By means of a rope and pulleys, the lone car exchanges some of its height with an auxiliary car, that was introduced in the experiment. The lone car descends from Level 4 to Level 3, while the auxiliary car climbs from ground level to Level 1. In principle, this height exchange does not involve energy. Similar height exchanges take place in Frame **9** and in Frame **10**.

Frame **11** – The exact same form of energy as Frame **7A**, 'height x mass at Level 1', can now be seen at Frame **11**, *but in different amounts*.

[* Frames **3A** and **7A**, 'Height x Mass at Level 1', could not be compared directly with Frames **3B** and **7B**, 'Height x Mass at Level 4', because the energy of a heavy body's descent depends on how that is performed. If all masses falled freely, the energy in all the mentioned frames would be the same, naturally. That was why in this example, #2, the comparison was made of frames in which the masses are found at the same level, and that's why the current form of the notion of gravitational potential energy harbours a fundamental flaw. However, this paper is, as it was already stated, restricted to its main subject.]

Conclusions (* Same text as in page 2)

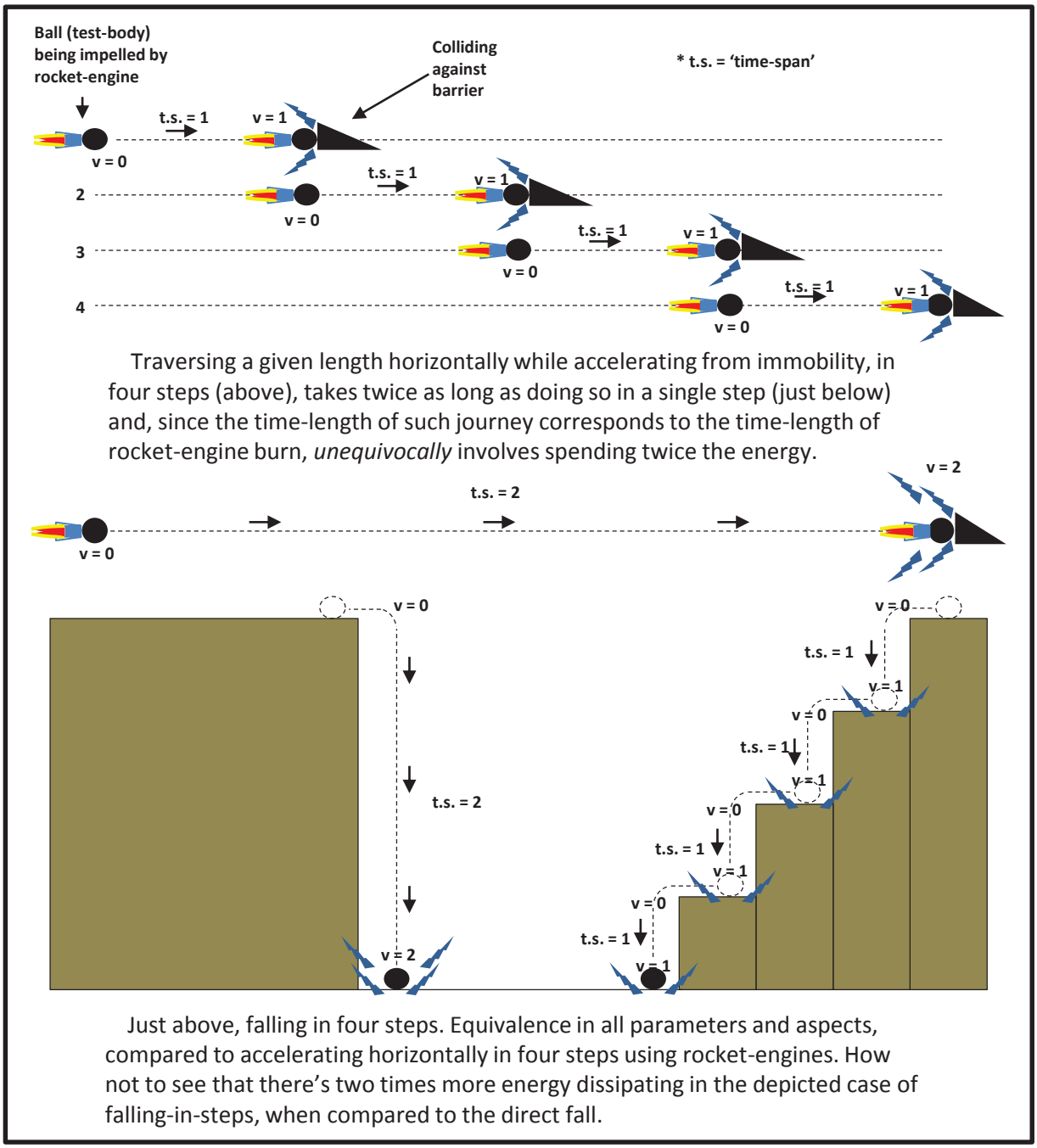
Frame **7A** and frame **11** present energy of the same form, but in different amounts (and there's no other form of energy anywhere anymore). Since those result from the conversion of the same initial amount of energy, some energy has to have disappeared in the first case, or some energy appeared in the second case, *given by gravity*. The last conclusion, naturally, is the one this paper advocates.

* For the rest of the conclusions see pages 2 and 3 of this paper.

Example #3- Comparing the energy dissipation of accelerating horizontally in multiple steps and accelerating directly, with the energy dissipation of falling in multiple steps and falling directly

The following illustration, that was taken from the original version of this paper and was not adapted, serves the purpose of this short version: It aims to demonstrate that to fall in multiple steps dissipates more energy than to fall directly, and if there's more than one way, on the point of view of energy, of traversing a given vertical length, then it is possible to harvest energy from gravity. I feel compelled to reiterate the invitation to leave mathematics aside temporarily; there's no need, for the present analysis, to make classifications as momentum, kinetic energy, work, and doing so might only hinder. *Just follow the energy,* that starts out as fuel inside the rocket-engines and then dissipates in the collisions.

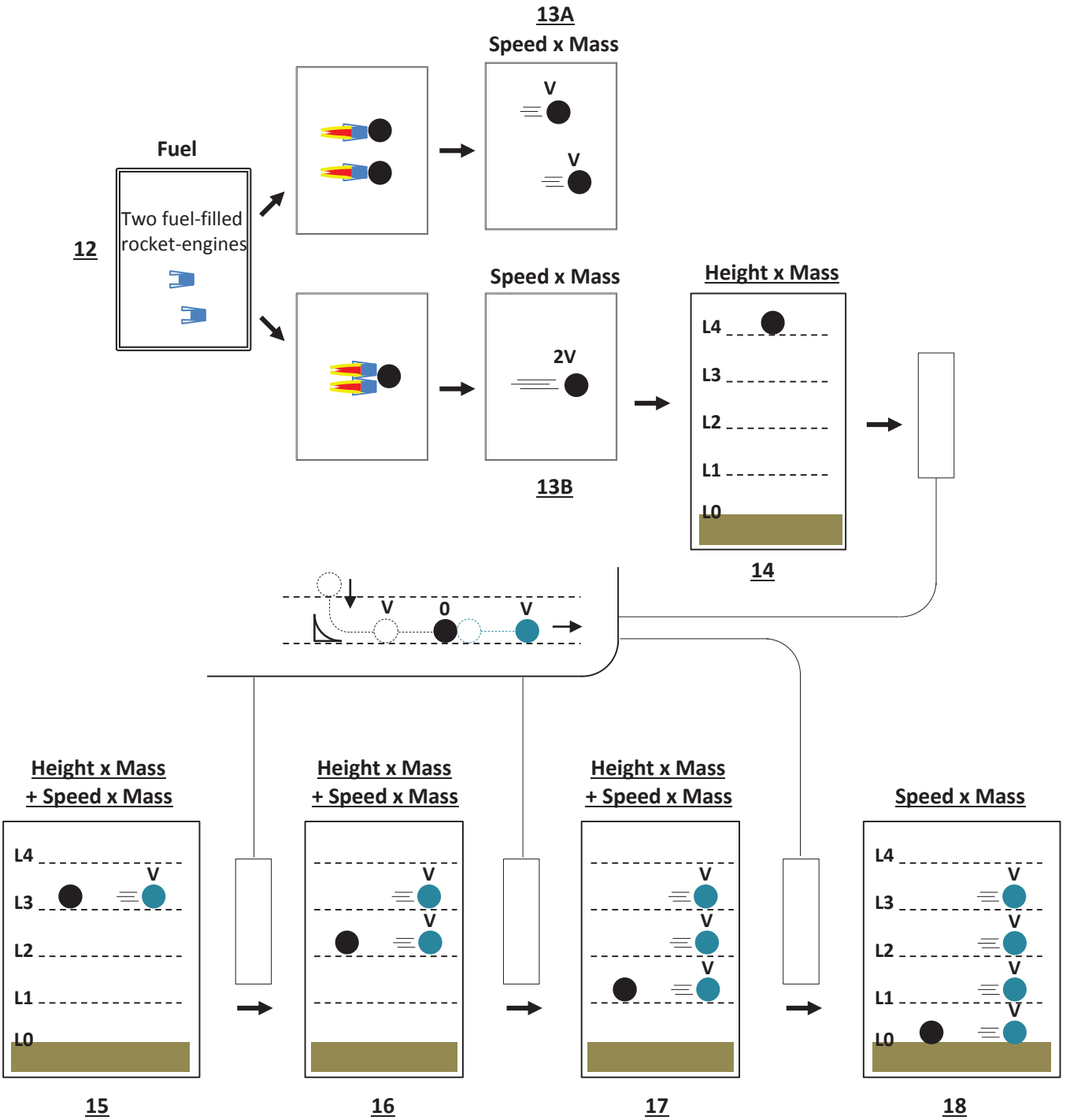
The horizontal equivalent to falling in multiple steps unequivocally involves more energy



Traversing a given length horizontally while accelerating from immobility, in four steps (above), takes twice as long as doing so in a single step (just below) and, since the time-length of such journey corresponds to the time-length of rocket-engine burn, *unequivocally* involves spending twice the energy.

Just above, falling in four steps. Equivalence in all parameters and aspects, compared to accelerating horizontally in four steps using rocket-engines. How not to see that there's two times more energy dissipating in the depicted case of falling-in-steps, when compared to the direct fall.

Example #4- From two portions of fuel, to two masses at a certain speed, *or four masses at the exact same speed*. ('Falling in multiple steps')



Frame **12** – Energy in the form of 'two portions of fuel'.
Frame **13A** – Two test-bodies get one fuel-filled rocket-engine each. They accelerate horizontally, converting the fuel into 'speed x mass' (momentum), and the speed they reached gets called 'V'.
Frame **13B** – The two rocket-engines were attached, in this case, to a single test-body, and the fuel content was converted into reaching the speed 2V.
(* The justification for this conversion can be found in page 2.)
Frame **14** – The speed of the lone test-body is converted to height, and the level it reached was called 4H (Level 4), with H being the height that would have been reached case the speed was half of what it was ('V' instead of '2V').
Frame **15** – The test-body falls from Level 4 to Level 3 reaching the speed 'V', and its motion is made horizontal by the use of a curved ramp. The test-body collides against an identical auxiliary test-body, transferring to it its velocity. The main test-body rests stationary one level below that it started, and the auxiliary test-body moves horizontally with the speed 'V'. Similar operations will take place in Frames **16, 17, 18**.
Frame **18** – The exact same form of energy as in Frame **13A**, 'speed x mass', can now be seen at Frame **18**, *but in different amounts*.

Conclusions (* Same text as in page 2)

Frame **13A** and frame **18** present energy of the same form, but in different amounts (and there's no other form of energy anywhere anymore). Since those result from the conversion of the same initial amount of energy, some energy has to have disappeared in the first case, or some energy appeared in the second case, *given by gravity*. The last conclusion, naturally, is the one this paper advocates.

* For the rest of the conclusions see pages 2 and 3 of this paper.

I anticipate my thanks to any comments, here on Vixra or directly at brastap@gmail.com

* I can retribute the comments by sending a free copy of my book '*Space Flow'. It begins as a sink-flow thesis with the game-changing characteristic of a medium composed of atom-connecting filaments instead of a medium composed of loosen particles (the two features combined unveil the universe *at once*), and in the end reached a model in which continuous creation is the paramount characteristic of the universe. Energy is how we perceive the pressure intrisic to continuous creation, Time is our interpretation of continuous creation itself, affecting every atom in the universe, and motion is a directional imbalance in continuous creation - that's why there is a cosmic speed limit, that's why there's energy intrisic to motion. Newton said that assuming a dragless 'space' enabled him to make calculations, but that it takes insanity (his words) not to see that a real medium participates in the gravitation phenomenon. He said that he, however, had not seen the way to go, and therefore left the quest for the following generations. The quest finally is really on, the medium is composed of atom-connecting filaments, and continuous creation is the paramount feature of the universe. It is a wonderful new world, full of opportunities to scientists that (really) want to contribute to knowledge.