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The future of the Railway Transportation from the Science Fiction point of view

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Abstract

The main goal of the doctoral thesis from which this article arises, is the search, analysis, investigation and obtaining conclusions about the particular vision and proposals in the Science Fiction graphic novel of the 20th Century, related with the Civil Engineering and specially with one of its disciplines, the Transportation Engineering. In this paper we anticipate and summarize a brief sample of the doctoral thesis, including some of the most important aspects of the research and the conclusions obtained in the Railway chapter exclusively. After the work done we will conclude that there are countless references to the Transports and also to the Railway world in the Science Fiction comic. The vision of the graphic novels' authors about the role of the communication infrastructures in the structuring of the city, its space, its function, the physical placement of the viaducts, the morphology, use and source of energy of the vehicles: (ground, marine, air ones and others) ... are constantly reflected in their stories, and they deserve a deep technical, social and even philosophical analysis, that we will try to accomplish in the mentioned doctoral thesis and, partially, in this paper.

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1. In the city

The guided traffic could not remain out of the imagination and the stories of the best graphic novels' writers and illustrators. And this is for a simple reason: If the imagined futures, almost always dystopic ones, very few times idilic, have in common the overpopulation, it seems very logic that they use the most usual mass transportation over the ground: the train.

Our first example has born in a time distant city, in which the space is scarce and the trains, if we can call them so, hung from a riveted girder. This way we avoid the occupation of a vital space on the ground, limiting it only to the construction of the necessary support towers.

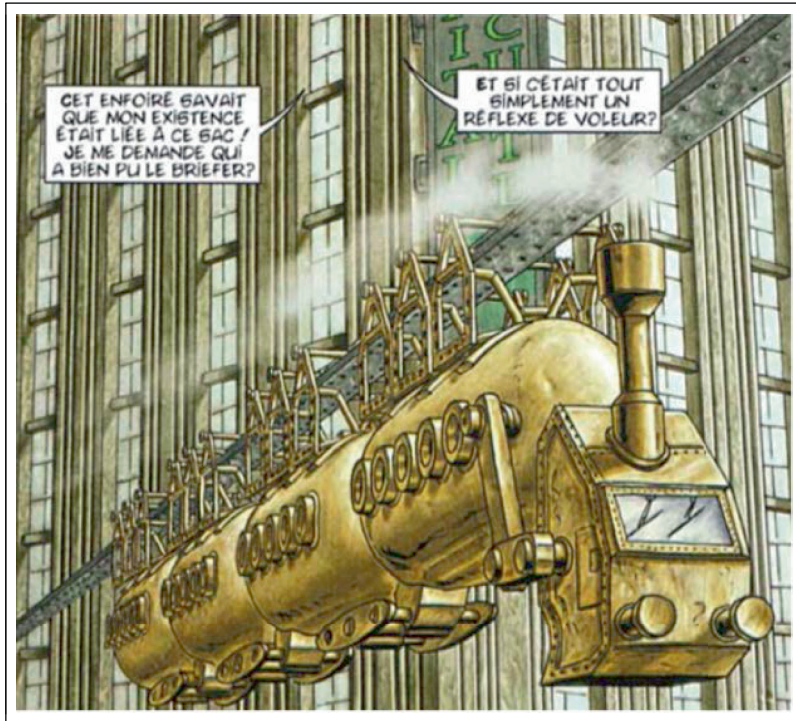


Fig.1.Single Girder Railway.

In the chapter title we have mentioned the word “retrofuturism”, and it is because in many comics the transportation vehicles, despite being technologically amazing and most probably impossible to be constructed with the nowadays technology, they nevertheless maintain some ancient characteristics that seem inappropriate for the time moment to which they belong. We have already mentioned the riveting, since long ago abandoned, but it appears often in the graphic novels. But the most surprising is the steam produced by the engines, almost never explained. We dare to suppose that in these distant futures the vehicles won't work with combustible fossil fuels, already extinct, if you allow me the joke, but with atomic batteries, which processes will produce the evaporation of the water moving the turbine that will produce the electricity moving the engine. Or maybe they will use hydrogen engines, which also generate steam going out from the exhaust pipes of this vehicles. The authors like to mix the modern with the ancient, use, for example, today windscreen wipers in a time where it seems that this technical problem should have been solved long ago. In Fig. 2 we can also appreciate the reappearance of the old- and almost extinct nowadays- self-propelled “Zeppelins”, garnished in these distant futures with the most diverse cabin configurations. This affects, as we can also see in the picture, the design and construction of the rooftops of the buildings, that need to harbor little airports for the arriving passengers. But this will deserve a special chapter in the

mentioned doctoral thesis and we will not deepen on this point anymore.

Where do the Science Fiction graphic novels creators find their inspiration to create their paper dreams? In this case, the single girder train, we find many versions of this technical solution along the years made by the engineers. Some of them were constructed and some of them not. We can see in the following pages some pictures of ancient



Fig.2. Configuration of the single Girder train in the cities of the future

models that never saw the light o stayed only in mere prototypes. The first one is the “Flying Train”, Fig. 3, published in the Popular Science Magazine in December 1919. It was a hybrid design of a non flying plane circulating over a steel beam. proposed by the French engineer Francis Lauer.

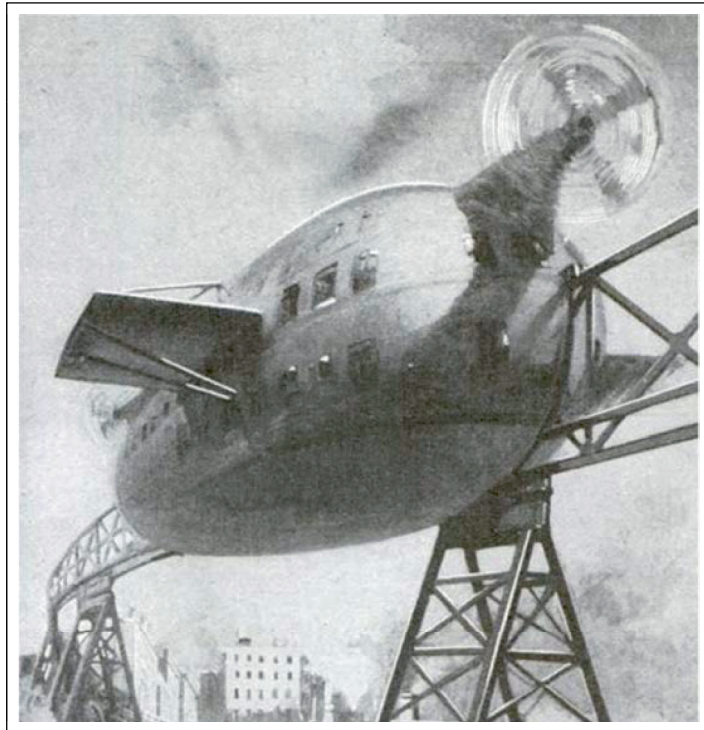


Fig.3.Francis Lauer design.

Later on, in 1934, see Fig. 4, it was published in the URSS the idea and design of the construction of an "amphibian" railway across 500 km crossing ground and water. The vehicle could leave its rails and get on the water to cross the rivers when necessary.

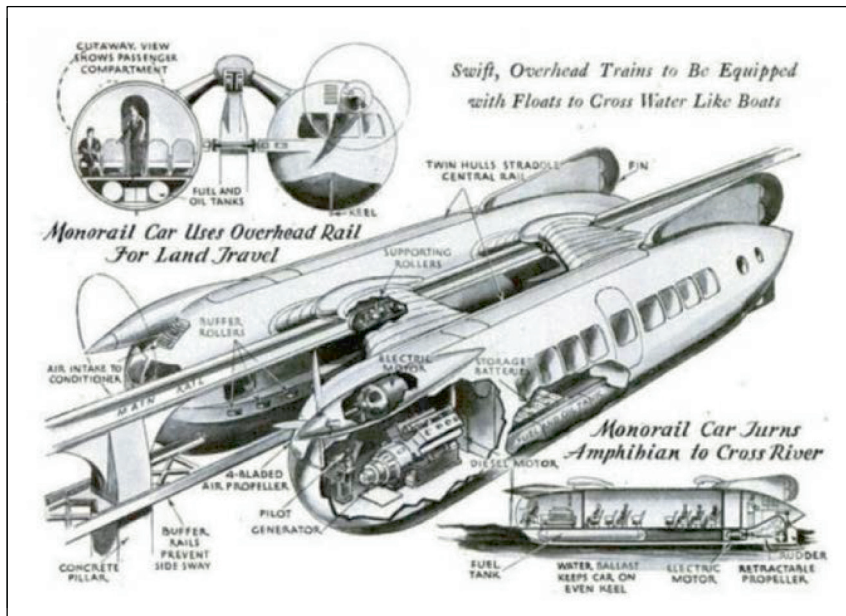


Fig.4.Russian design of an amphibian train.

In 1923, also in the Popular Science Magazine, appeared the proposal of a railway net constructed over the New York’s buildings, with giant hanging bridges anchored to towers supported over the sky-rappers. The passengers would get in them through lifts placed in the centre of these towers.

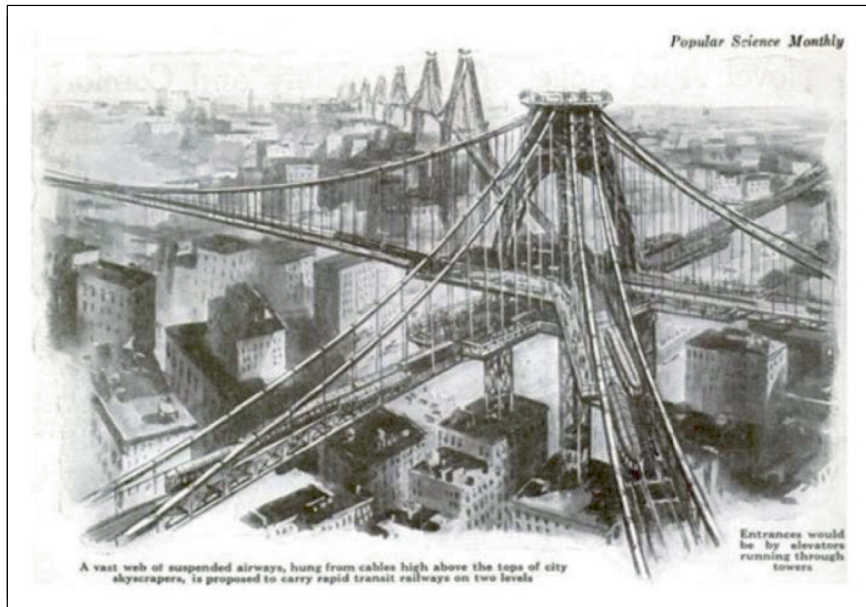


Fig.5. Railway net over the city based over the buildings roofs.



Fig.6. Railway structure overflying the buildings of the city .

The idea of the urban train over the single girder was described also in 1972, see Fig. 6, with a very similar solution to the comic we saw before, with the single riveted girder. Does the author got his inspiration from here? In the next picture the illustrator has used the system of Fig. 5 explained before:

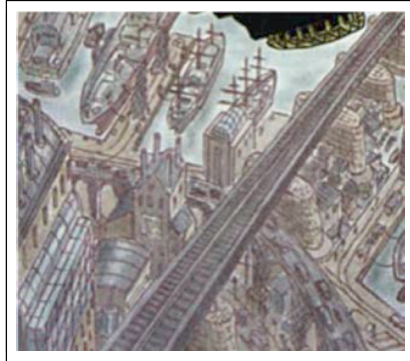


Fig. 7. Railway structure overflying the buildings of the city

In order to free space in the collapsed city (a today's also very typical problem), the railway has been removed from the ground and sustained over giant piles much higher than the buildings.

Another example of railway transportation turns to be very interesting a imaginative. We find it in a stadium where the described society in the comic enjoys some kind of very violent competition. The broadcast booth moves horizontally over rails, following the stadium ellipse:

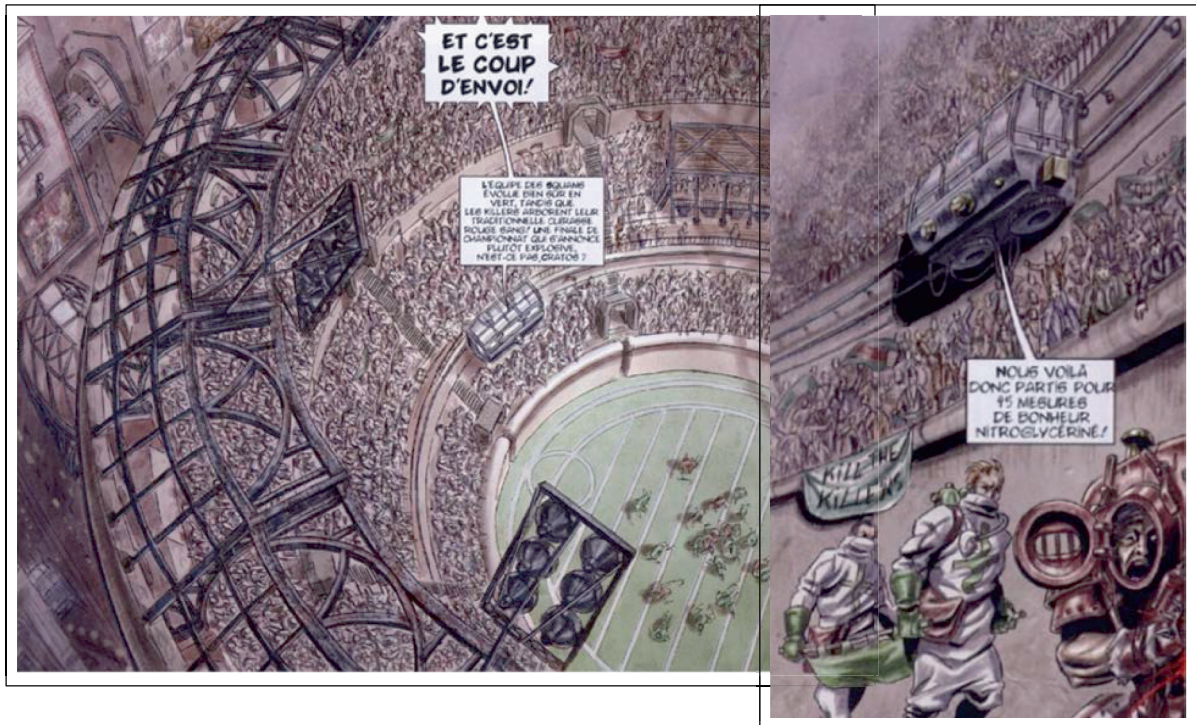


Fig. 8.(a) Elliptical railway. (b) Booth view

And coming back to the conventional railway, we find another example of a steam train, despite being constructed in the future. This case belongs also to the “retrofuturism” above mentioned and that we will find so often in the comic world.

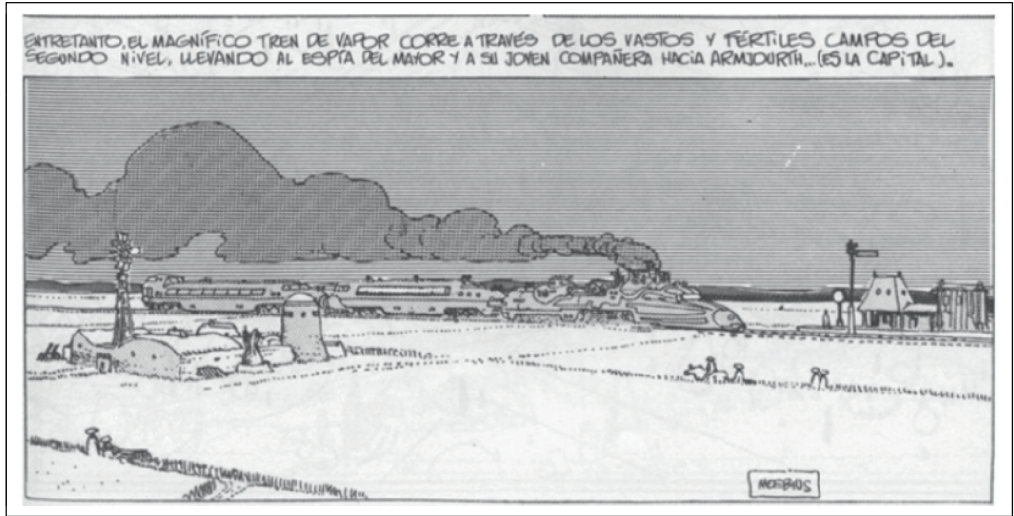


Fig. 9. “Retrofuturistic” steam train.

We ignore the source of energy it uses, but we can see the giant train station where the train arrives and the details of the reparation hangar. Is it a watering engine what the technicians are connecting to the train in the maintenance zone? Or is it just a welding work? The uniforms used by the employees also mix the retro aesthetics in order to create an interesting confusion which defines the author’s style.

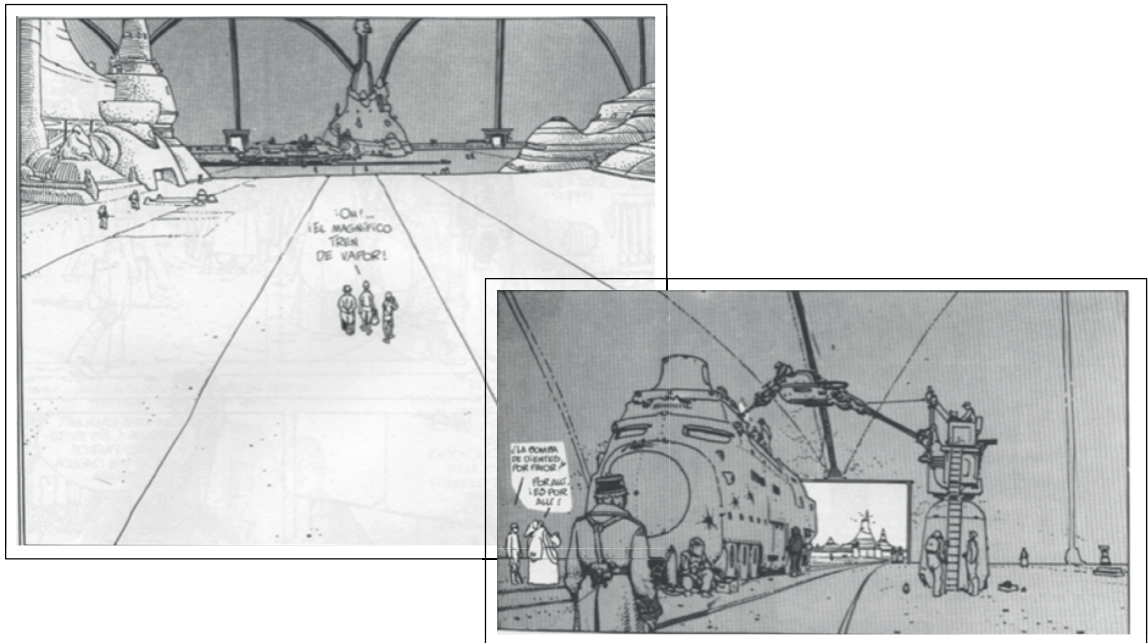


Fig. 10. (a) Giant train station (b) “Retrofuturistic” locomotive .

In another author, the rails are also used as take-off platform for flying vehicles. In the following pictures we can see, in the top of a building, how these flying engines take-off relying in a double welded rail used as guide for them to gain speed and then leave the ground.

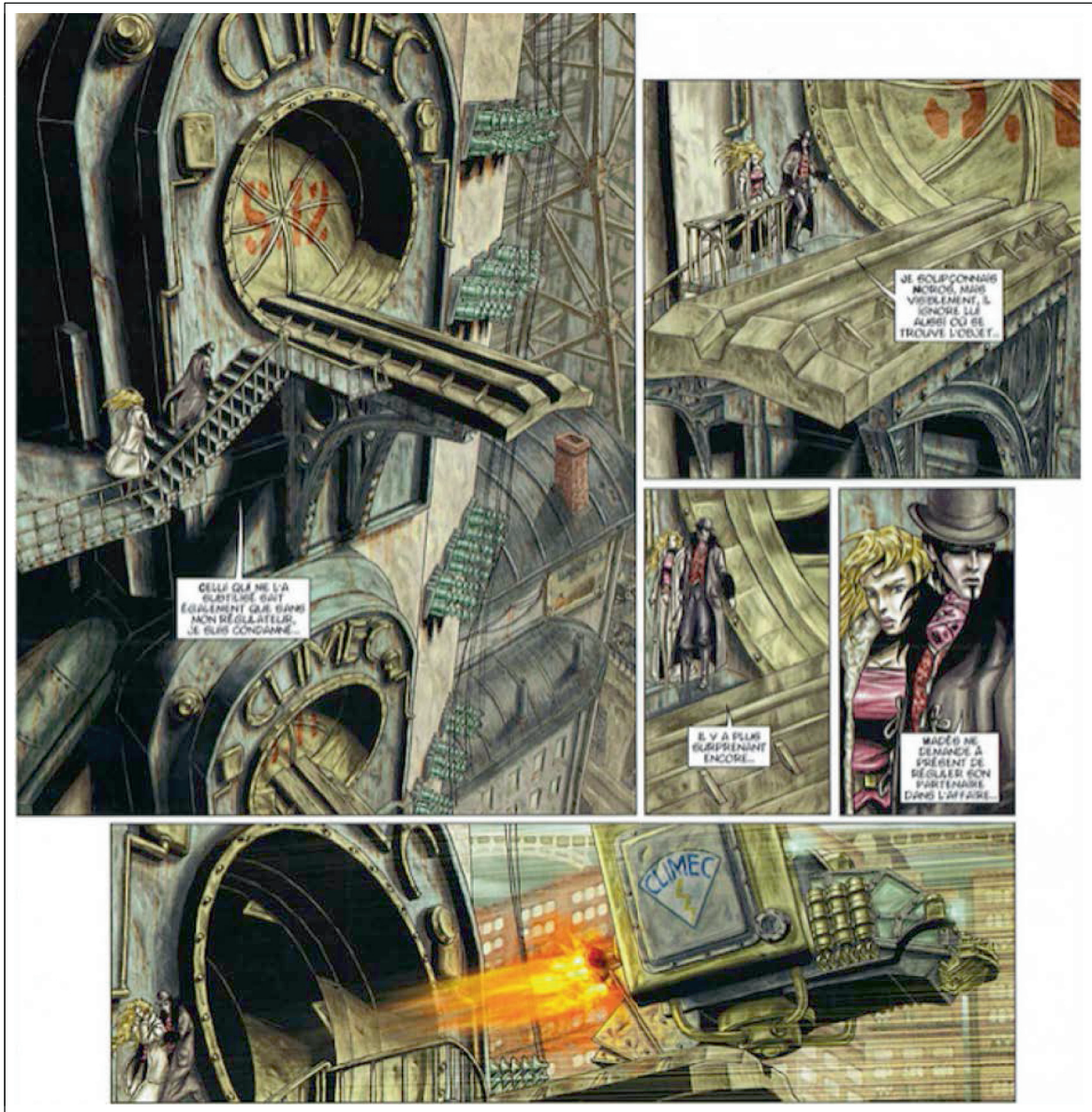


Fig. 11. Rails used as take-off platform.

However, instead of contacting the rails through wheels, these vehicles fit into both rail tabs with a ball, achieving to remain in its place the few seconds they need to take-off.

2. In the factory

The following example, of vehicle guided by rails, comes from inside an industrial plant, manufacturing chemical products:

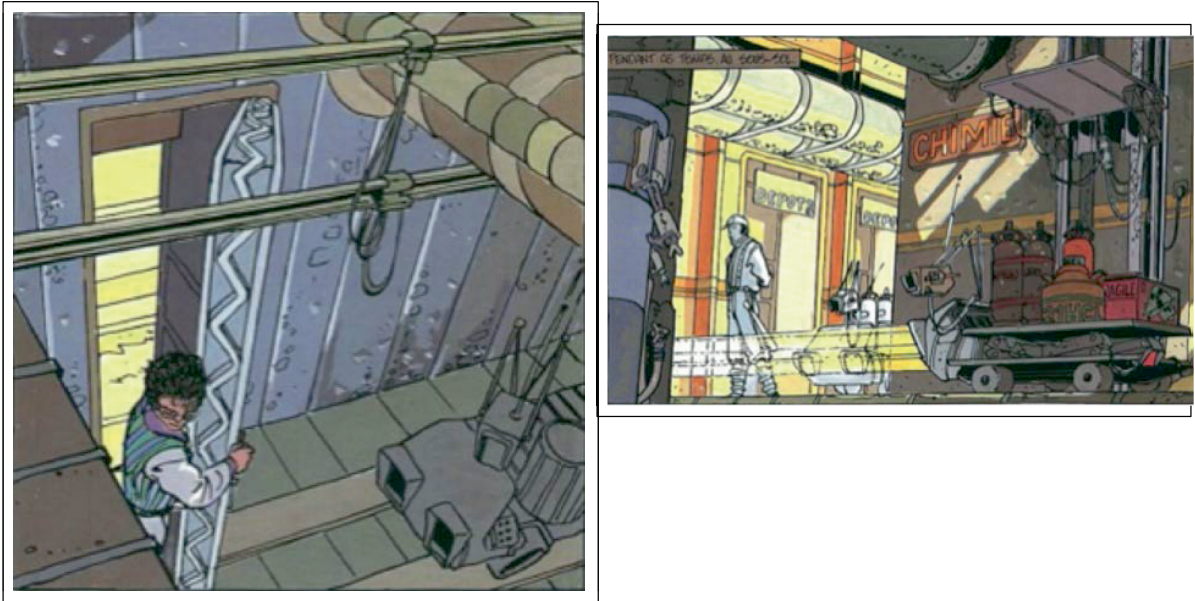


Fig. 12. (a) Dip Lorry in an industry. (b) Guiding system of the Dip Lorry .

We could consider it as a Dip Lorry used for the internal displacement over rails of platforms charged with material. This one is used to transport any kind of goods, probably dangerous as we can see in order to avoid human beings transporting it. The guided system make us ask some questions. The necessary tabs in the flanged wheels are absent, and they should be there to avoid derailments of the vehicles. Nevertheless we can observe something that could substitute it. It is a camera placed in the front of the Dip Lorry, may be able to determine when cornering should be done and how to do it. Besides this, it seems that the front lights issue a light beam that could be used to stop the vehicle in case of finding an obstacle in the way, because it doesn't seem to be used to give light as it hasn't any driver.

In our last examples, also used in industrial environments or underground, we can appreciate with detail the existence in Fig. 13 (a) of two vehicles traveling along a single rail that is used to guide them, and most probably also as energy provider. On the top left of the picture we can observe a little train with machine driver, with a big wheel with a middle cleft in its frontal side with which it is guided. Down right in the same picture we can see a little gauge switching point that enable the Dip Lorry of the right side to decide to go straight or turn left. This mentioned Dip Lorry is driven by just one person and it is used, obviously, to carry heavy things.

In Fig. 13 (b) we can also observe a small vehicle, which we could also consider as a Dip Lorry, for transportation and classification of railcars, probably in the underground system. We can observe some curious facts, as for example its flanged wheels, they are not made of one piece but it is the conjunction of two different cylinders screwed in their axis. We can also be surprised about the leanness of the railcar, or about the use of the lateral wheel, probably made of rubber, which seems to protect the vehicle against the metal beam in the side. Or maybe it is a contact point with the third rail which provides electricity, as in many world underground trains today?



Fig.13. (a) Single-rail guided vehicle. (b) Underground trains classifier .

3. Conclusions

The fascinating world of the railways has inspired, as we have seen in this paper, a great amount of Science Fiction graphic novels creators. All of them have contributed with their imagination, bringing all kind of solutions which, some of them, could be very useful for an engineer. The single girder railway flying over the city to liberate space in the urban centre, the hybrid amphibian railways models, the construction of railway structure in the top of the sky-rapers, the very original broadcasting booth over rails to broadcast the games in the stadium, the retrofuturistic steam locomotives working with atomic batteries or hidrogene engines, the rail take-off platforms used by the city flying vehicles and the different solutions of Dip Lorries imagined for working in factories, all of them, give us a brief impression of all the ideas an engineer could store in his backpack, ideas that maybe some day could be the origin of the inspiration that will lead him to find new engineering solutions to new and unsolved engineering problems. Allow me to remember that this doctoral thesis, from which this paper is born, tries to fulfill the existing void of methodical data collection of Civil Engineering futuristic proposals in the Science Fiction graphic novel world.

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