From: Kerr, John L
Sent: Friday, September 23, 2005 7:18 AM
To: 'editor@triz-journal.com'
Subject: TRIZ dreams

Last evening, I read the first 16 principles in *40 Principles: Extended Edition: TRIZ Keys to Technical Innovation*, by Genrich Altshuller, (New Edition with commentary by Dana W. Clarke, Sr). This morning at 5:30am, I woke up with the answer to two problems. One was for work, and the other was for not-work. The second one was more interesting, and it really did come to me after the first. And it was the one that my brain seems to have solved using TRIZ.

The problem relates to our house, which is a second home for us, 40 miles south of Rochester, NY. It is a nice old farm house, built around 1905-1910. Over the years, previous owners have done some remodeling, which has left us with a slight sag to the floors on the second floor. We brought in a structural specialist for a consult and he explained that the floors on the first floor were sagging slightly as well. But it can be fixed, if enough money is applied to the solution.

In our discussion of options with him last week, he offered an idea that would completely transform the downstairs. His initial suggestion was that we add supports to the living room ceiling, to jack up the floor and raise it 3", which will fix a sagging problem upstairs. But as we talked about what would be required, our long range plans for remodeling the kitchen came up. He said that if we extended the new supports straight through the downstairs, we could support all the load bearing walls from a central column in the middle of the house, and do away with load bearing walls on the first floor entirely. This would open up the space and make our gorgeous view available everywhere downstairs.

The view downstairs is one of the key benefits of this house. We have tall, unobstructed, insullated windows that run from the southeast corner of the living room around the corner halfway along the north side. From here, we can look out across to the other side of the valley, more than a mile away. Since we moved in back in February, we have seen three seasons. The fourth (fall) will start in a few weeks. When we give people directions to our house, we have to tell them to ignore the view to the east when they get close to our house or they will miss it. Yesterday, a guy in a tow truck stopped on the road in front of our house and took a picture with his cell phone. He wasn't the first.

So, the idea of being able to see this view from the back of the house is very attractive. When the structural specialist suggested replacing the staircase with one that was open, it made me wonder if we could change the direction of the staircase entirely. Rather than going from the center of the house on the first floor to the outside on the second, could we start at the outside and end up in the center on the second floor. While this would open up more of the first floor view, it creates a problem getting to the basement, which has a staircase under the current stairs to the second floor. But if we switch one, we could switch both, couldn't we? And if we switched one, we could add a third staircase to the attic, and eliminate the folding staircase currently in place.

Here is where TRIZ comes into the picture. Having a staircase to the basement in the middle of our livingroom would be rather unsightly. But if we had a staircase that was both there and not there, we would have the functionality without the break in the view. While we would probably only walk on a few square feet of the space under the stairs to the second floor, we would use that space, if it were available. The idea that came to me when I woke up this morning was a door in the floor. But rather than opening along the long edge, this door would open on the short edge, so that it came up underneath the other staircase. When the door is closed, it looks like part of the floor. When the door is open, it could have guards that keep people from walking off the edge and falling into the basement.

As something like this would need to be heavy enough to be a floor, and light enough to lift when access to the basement is required, one of the TRIZ principles resolves the problem. Number 8 - Counterbalance gave me an idea to have weights in the basement that raise the door slowly whenever access is needed. They would also lower in slowly when no longer needed. In reality, the door would probably need to be balanced so that it wanted to stay closed, but allowed minimal force to pull it up.

The surprise was quite astounding, so I went back through the book to see what other principles might have helped me figure out how to exploit this opportunity. Here is what I concluded:

- 6 - Universality. The door to the basement can also be a floor in the living room, making it possible to see more of the view from the entire downstairs of the house.
- 9 - Prior Counteraction. The door could be balanced so that it wants to be a floor, through preloading.
- 12 - Equipotentiality. The counterweights could be selected so that the force required to raise the door is minimal. When released, it would go back down.
- 13 - Do in Reverse. Instead of having stairs that so from the center of the house up to the outside, the stairs would go from the outside up to the center.
- 15 - Dynamicity. When the basement door is a floor, it needs to be as solid as a floor. It may not be a direct part of the traffic pattern, but it will need to feel solid if anyone walks (or dances) on it. But when it opens, it needs to be light enough (through counterweights) for anyone to open easily. And it should close itself also.
- 17 - Transition to a New Dimension. Here we are utilizing the opposite side of the staircase opening. We improve the view downstairs, and add a window or two on the south side of the house. We also gain a permanent staircase to the attic, which increases our usable floor space without increasing the footprint of the house.
- 24 - Mediator. We want to have a continuous open area, but keep our access to the basement. We can have a temporary door that is easily removed, and use a counterweight to help raise it when necessary.

Of course, all these ideas are going to cost something. But given the breathtaking view, we think the investment will produce a significant return. It will also level the second floor, so that my home office no longer has a 3" drop from one corner of my desk to the other. This will mean my chair will no longer roll toward the corner. And that would mean I might be able to rotate the entire desk clockwise 90 degrees so that I could see out the windows rather than having them behind me. This gets better and better the more I apply TRIZ.

I would like to thank all the authors of articles in TRIZ-Journal for their inspiration. If my wife and I figure out a way to make this work, I'll write another letter to the editor and explain what worked, and what other principles I applied to fix things new problems that came up along the way.

John L Kerr
585-298-1462
Springwater, NY
mailto:johnkerr@rochester.rr.com