

RTC - Road Turning Cautioner

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Abstract - RTC is a device used to make corrugations in construction of Road, which will help the drivers to know whether his car is being OFF the Track from the road while taking an off-spin turn. This will prove to be a life-saving if the driver is sleepy or his headlights are broken. If the vehicle is about to go off the road for any reason that he is not aware of, the slight up and down movement due to corrugations will alert him to keep his car on the Lane. Also, if the Driver is being dangerously off the track he'll experience concussions of larger magnitude and will wake him up if he is Sleepy. RTC also serves a task of draining water off the road as quickly as possible and avoid damage due to water logging.

Key Words: Corrugations, Off-spin turn, sleepy, concussions, Draining water

1. INTRODUCTION

The invention works on the concept that when the driver in about to go down the lane due to any reason the corrugations at the end of the road will cause disturbance to the driver and if he is sleepy will wake him up and alert him to keep the Car on the Road. If the Driver is little bit off the track then he will receive small concussions but if he is going dangerously off the track then the concussions would be of large magnitude alerting the Driver. This will even work if the driver has visual issues as the whole vehicle will start vibrating and he will become aware of the fact that his car may go off the road thus avoiding an accident.

Water is one of the major factors damaging the road which seeps in the road and settles the soil underlying it, which then leads to potholes in the middle of road causing inconvenience for the passengers. This system (RTC), in addition to alerting the driver about offsetting also allows the water flowing or ponded on the road to seep through these holes and go to drainage lines thus clearing water on the road.

On off-spin turn of mountain roads, corrugations can be made shallow at the center of the road which would get little deeper as the vehicle move towards the edge of the road. So if a vehicle is about to go off the road the driver will feel small concussions thus he will get alert and drove his vehicle on the road. If a sleepy driver drove his vehicle off the road, the vehicle will undergo large tremors, which would be

enough to wake him up. This system will thus be saving lives and making a huge impact in road safety.

2. PROBLEM STATEMENT

Mountainous roads in India have many dangerous curves. Over 1,37,000 people were killed in road accidents in 2013, and the figures are almost the same every year. This is more than the number of soldiers killed in all the wars put together that we fought [1]. Thus, there is high rate of accidents and most of the accidents in mountainous road curves happen due to sleepiness of the driver. Many highways in India lack proper warning signboards about the upcoming curves and an overconfident careless driver end up into accidents in hilly mountainous roads.

"Engineers estimate that at least 90 percent of a road's problems are caused by water. The top way to preserve your roads' strength and extend their life is by providing drainage" [2]. In India provision to drain water off the road is still not made in spite of knowing the above-mentioned fact due to whatsoever reasons. The Indian Roads even highways get a lot of potholes which damage the vehicles as well as cause a lot of inconvenience to the driver.

Table - 1: Individual ownership of automobiles and official road traffic fatality rates for every 100 capita

Country	MTW + light 4 wheelers per 100 capita	Fatality rate per 100 capita
India	6*	11
United Kingdom	54	2.8
Australia	71	5.1
Hungary	32	6

* Vehicle ownership rate adjusted for number of actual vehicles on road.

3. SOLUTIONS IN MARKET

The Government has made many arrangements for the turning safety, few of them are:

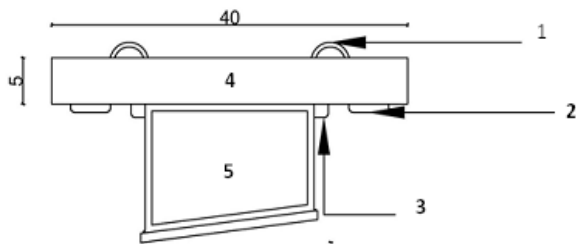
1. Using LED reflectors to show path of Lane.
2. Using radium Reflectors all along the curve.

3. Using Warning signs Pre-curve.
4. Using White Color on Road to justify Lanes.

4. MAKING

(i) Male Formwork

The male formwork consists of 5 main parts which are mainly,



Components: (1) Handles (2) Rubber Soling (3) Field Weld (4) Flange (5) Web

(All Dimensions are in CM)

1. Handles – For placing and lifting. This allows user to handle whole of the male part of rammer and to lift the assembly and to drop it in the female formwork
2. Rubber soling – To Ease the ramming effect and lessen the impact, also it can be changed for different depths to get customized depth of main job. So, to change the dimensions of main job all the user needs to do is to fit the appropriate dimension of Rubber Soling. If smaller and thinner Rubber Soling is used it will make the Main Job (Fig-3) Larger.
3. Field weld – Used to make whole instrument a single unit and keep the assembly rigid.
4. Flange – Will be used to create obstruction thus giving the main job a proper height and consistency throughout. It is also taking all the impact and giving the Rubber Soling proper place to Fix.
5. Web – It will be rammed on the main job to compact it. It acts as the head of the hammer which will take all the beatings and compact the bitumen or the Mix.

(ii) Female Formwork

The Female Formwork consists of just a Formwork which will Place the Mix.

1. Formwork – This metal assembly just acts as a mould in which the Bitumen can be poured and allowed to set.
2. Cavity – It is an empty area, a container which provides space to fill the mortars or mixes, compaction takes place right here in this Cavity area.



Fig. 2. Female Formwork (All Dimensions are in CM)

Components – (1) Formwork (2) Cavity

(iii) The Job

This Figure represents the Main Job how it will look after placing on the Road, this is the object or Job which is being manufactured.

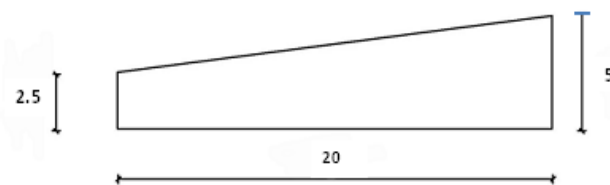


Fig. 3. The Job (All Dimensions are in CM)

Following figure shows visual representation of how the Main Job will be placed along the progress of the Curve of the Road.

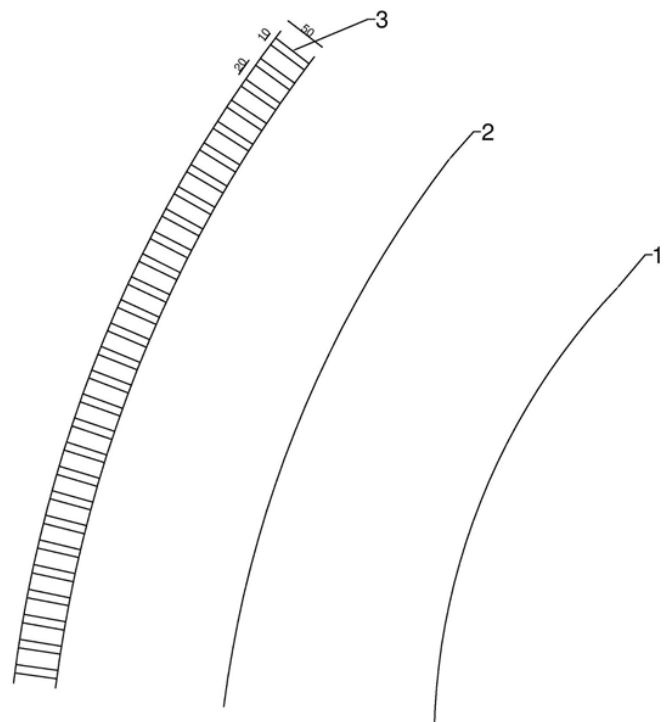


Fig. 4: Site Plan [(1) The inner Edge of the Road's Curve (2) The Centre Line of the Road's Alignment (3) These are the Corrugations along the Progress of the Curve of the Road. This will also facilitate the water to drain through the corrugations.

The female formwork consists of Handles and formwork which is mainly used to imprint the design on the road. Using both the formworks together will make imprints along the road in the particular design as shown in Fig. 3 of Main Job.

5. WORKING

The bitumen is filled till the top layer of the female formwork (Fig.2). The male formwork will be continuously ramped on the female formwork, and then compaction is done by the male formwork until impressions are made on the road. The male formwork is continuously ramped until proper shapes are formed. Handles are used to handle the male rammer. The impressions would be made on the road as shown in Fig. 4 of site plan. Thus, it is provided in similar way on the road along the curve.

To make the corrugations along the curve without hampering its strength and enhancing the drainage facility the following steps needs to be followed,

(a) First the Points are marked on ground along the alignment where corrugations need to be provided, (Fig. 4)

(b) Along the marked points the assembly of Fig.2 should be placed

(c) Then the Bitumen Mix should be poured till Surface in (Fig.2 part 2) till Cavity and filled completely and there is just a bit Lump over it. (Bitumen should be Hot)

(d) 2 Workmen should lift the assembly of Fig.1 by gripping the (Part 1) and slipped in the Female Formwork (Fig.2 Assembly)

(e) Then (Fig.1.Part 1) should be released from certain height and Rammed continuously till the Job (Fig. 4 Assembly) is compacted and of desired Dimensions.

(f) The Edges must be given a smooth curve of the Main Job and other small defects must be eradicated manually by Labour giving descent Aesthetics.

The Driver thus will face Small concussions when he is little off the track and Concussions of large magnitude if he is dangerously off the track. Also, the corrugations allow the water to dispose off from the main road to the drainage, by facilitating the flow of water off the road and the water is not staggered on the road and hence not hampering the Condition of Road.

6. CONCLUSIONS

This research paper covers the design of the invention and its working. This invention seems quite practical in real life situations as it could be an add-on to current infrastructures.

Using this technology for highways and mountainous roads the number of accidents leading to thousands of deaths

every year could be minimized. The idea of making corrugations on an off spin turn of hilly areas will surely alert or awaken the driver going off the road. This technology would be cheap and it will also increase the life of road by providing the proper drainage.

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