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A New Design of Wagon Tippler

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ABSTRACT: *This is a completely modified design which can easily discharge the wagons with in a limited time and save energies and increases the efficiencies and save income with a short and an easy principle such as a complete rotation or an another principle of application of triangles.*

Keywords: *Triangles; complete rotation; link mechanisms*

I. INTRODUCTION

A wagon tippler (Fig 1) is mechanical equipment which is mainly used in industries in order to discharge the raw materials from a railway wagons to the chutes.

Fig 1. Wagon tippler

II. PRESENT MODEL

In present model they are using a circular motion by placing a wagon stable in the wagon chamber by using a link mechanism which helps the wagon to be stable while it is in upward position (Fig 2).

In wagon tippler, whenever a wagon can be stabilized then it starts rotation by using DC motors and shaft coupling mechanisms and gear mechanisms. These gears are present along the circumference of a circular rim within the angles of 0^0 to 270^0.

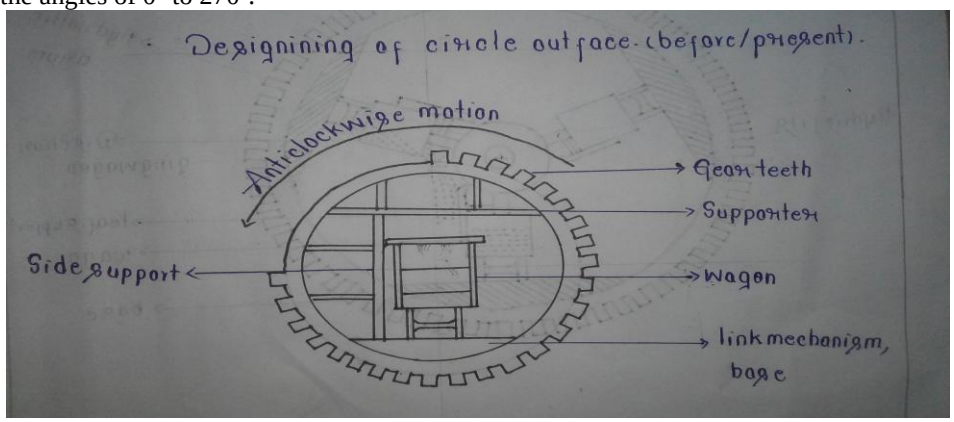

Fig 2. Designing of circle outface (Before /Present)

Whenever a wagon starts rotations in anti clockwise direction, then the raw materials which are carried by the wagons are discharged into chutes due to gravitational force which acts in the downward direction.

2.1.Losses :

- By using this present model, it can't be easy to discharge the wagons with in a limited time. Beyond this reason, they used to pay a lot of fine to the railway department.
- While discharging the raw materials due to air currents, some of the raw materials are thrown off from the positions of chute. This leads to a material loss.
- It is highly economical process

III. PROPOSED MODEL

We can overcome these losses by using the thoughts as follows.

1. Implementation of complete rotation.
2. Implementation of triangle technique.

3.1. Implementation of complete rotation of a wagon**:**

In general, after discharge of the raw materials from wagon, in order to remove the wagon from a wagon tippler it has to move 270^0 in a clockwise direction (Fig 3). Based on this point, why don't we exceed a 90^0 of rotation after discharge the raw materials from wagon at that position. By using this technique, we can save 180^0 of rotation.

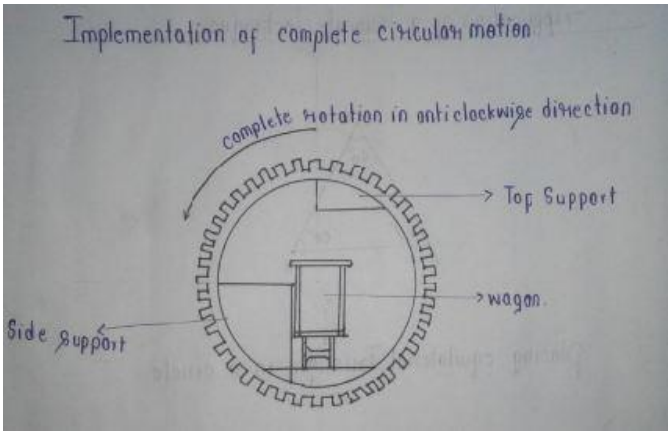

Fig 3. Implementation of complete circular motion

3.1.1Possible outcomes:

1. Easy discharge of wagons with in a limited time.
2. It do not requires any another motors for clockwise rotation.
3. It is the cheapest process.
4. It increases efficiency of an engine.
5. It saves the company from fines.

3.2. Implementation of triangle technique:

In general, if we assume an equilateral triangle which is present in the circle (Fig 4)(circum circle).

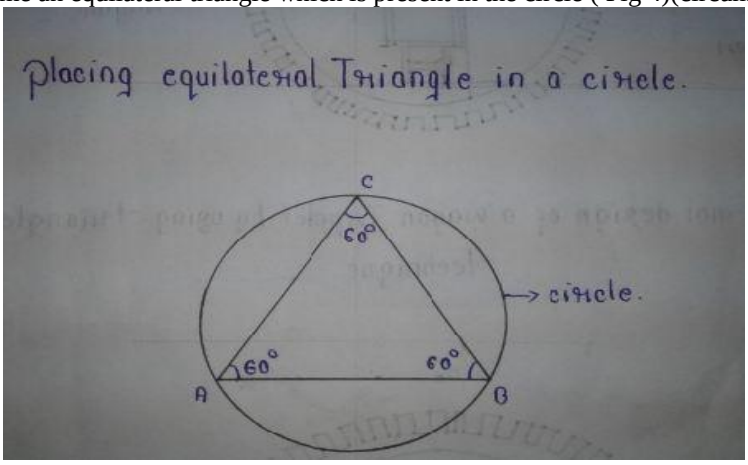

Fig 4. Placing equilateral triangle in a circle

If initially a wagon present at any one point of a triangle which tends to make an angle of 60^0 with two other wagons. If a wagon starts rotation in an anti clockwise direction then the raw materials which are present in the wagons or ready to discharge within a 60^0 of rotation.

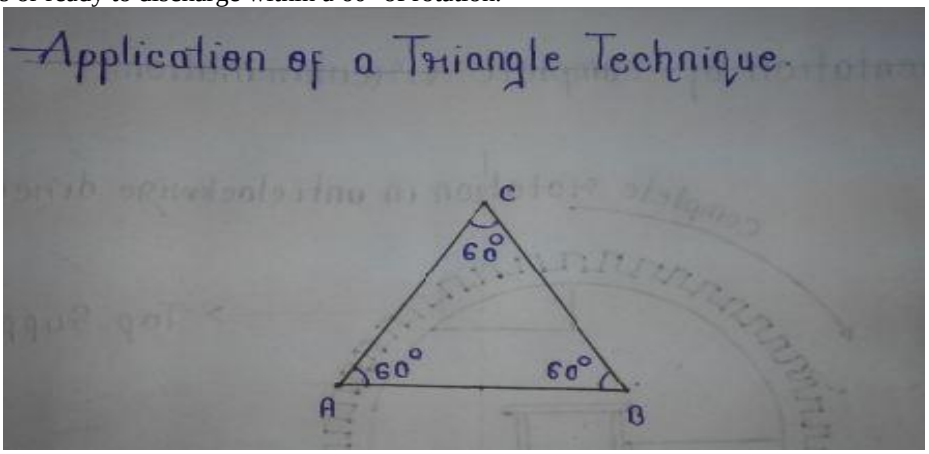

Fig 5. Application of a triangle technique

It is completely a circular motion mechanism which always be in a motion and it is easy to discharge the wagons within a short span.

IV. SUPPORTING MECHANISMS

If a wagon is present in the upward portion it is not easy to be stabilized. In order to overcome this problem we are using hydraulic support which mainly acts as a beam at the center of gravity point with supporting wall of ⎫ shape (Fig 6) which helps the raw material that do not falls in the wagon while discharging of another wagons.

Fig 6. Shaped wall:

It acts as a wall and also as a supporter while discharging raw materials from a wagon and acts as a wall so that it will not allow the raw material to fall into the wagon which is present at the bottom.

V. POSSIBLE OUTCOMES

1. It is the easiest process
2. It is very easy to discharge the wagons within a limited time

VII. CONCLUSION

Thus the modified design (Fig 7) gives the optimum usage of time and save lot of money.

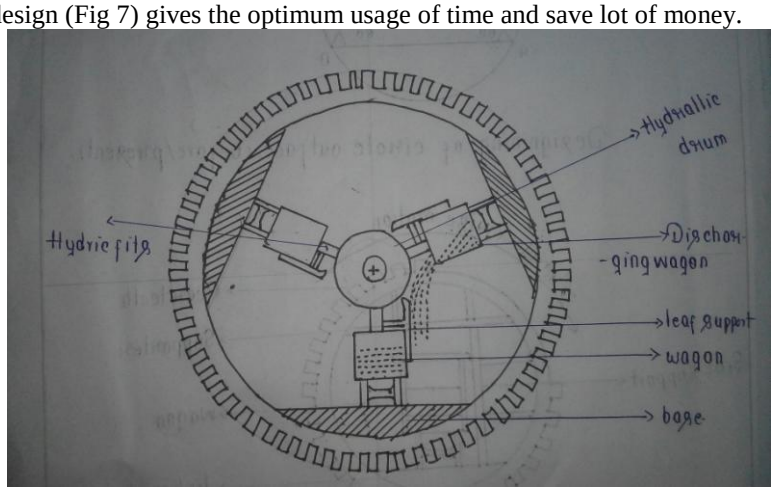

Fig 7. Modified design wagon tippler

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