

THE SAFETY ELEVATOR

1. N Ragunath

2. D. Vinod Kuma, 2.Ch. Sandeep, 2. M.V.S.S. Pradeep ,2.Y. Ravi Teja

1. Assistant Professor, Department of Mechanical Engineering,

2. IV Mechanical Engineering Students, Narayana Engineering college Gudur, Andhra Pradesh, India

Abstract -The main purpose of this document is to perform an analysis on elevator safety considerations. This report introduces the development of elevators through its history, definitions and commonly used concepts in the elevator industry. Elevators are already an important part of day-to-day life for thousands of people and have significant role to play in the future of urbanization due to increasing population density and decreasing real estate. Elevators not only make vertical transportation convenient, but also play an important role in providing accessibility for people with disabilities; so, it's safe and reliable operation is very crucial. Elevator maintenance and safety practices around the country are evaluated in this article and a study on various elevator related accidents was performed to recommend safety practices.

Key Words:urbanization, accessibility

1.INTRODUCTION

Most of all engineer's design to the safety lifting system for heavy lifting industries, the lifting condition whereas check it condition of rope, hook, grain structure and operated health condition, why is check it this condition means when your lifting the heavy material don't break the rope and hook. This is process neglect the system, we must fabricate this model, which contain the ratchet and pinion mechanism you are lifting condition when the time break it that a place automatically lock it our total system.

2. WORKING

This is system totally operated the lever mechanism, going to future model it is operated servo motor and any other motor system, which is used for safety lock system having ratchet and pinion gear mechanism and it is connect the rope by on pulley guide This hole component connects the Electrical motor, when you need the weightlifting system simply drive the hand lever and also drive pulley.

The pulley connects the pinion and also connect the weight it is going up step by step by in rack gear based Any one of the condition you have an unbalancing and leave the electrical motor condition that system totally stop and lock on ratchet and pinion system An elevator is a simple device which is used to save human efforts. The elevator won't need to use much energy at all The time because it will always be getting back as much (when it goes down) as it gives out (when it goes up). Elevator

Consists of simple hoist with a cage passing over a pulley. It uses more energy to lift people up, but it would have no Way of getting that energy back. So, elevator is the good example of law of energy conservation

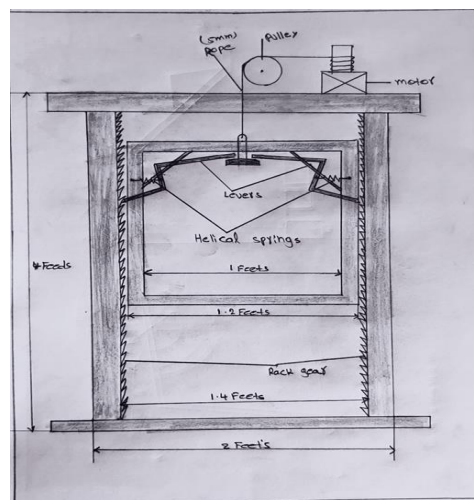


FIG -1: LINE DIAGRAM



FIG -2: CONSTRUCTION OF SAFTEY ELEVATOR

3. DESIGN CALCULATIONS

Elevator parameters:

- 3 Flores each Flore 1.66.
- Counterweight = 18kg.
- Lift weight = 12kg.

- Motor capacity which is project is use 0.5hp motor (0.37kw) for this Motor section
- Capacity: 0.5hp, 220v.
- 1-4motor in used in this project usually 1HP motor a lift the weight of 550
- The work done is based on horsepower (hp).
- For describe work done in each amount of time is based on horsepower (HP).
- For example:
- 1hp = 550 pounds/second.
- $2 \times 0.5\text{hp} = 550 \text{ pounds/second.}$
- $0.5 \text{ hp} = 550/2 \text{ pounds.} = 275 \text{ pounds/second.}$
- In one second motor can lift 275 pounds of weight (in kg = 124.7 kg) = in ideal condition.
[Note: 1 pounds = 0.45 kg]
- The lift in travelling nil loads is 15kg potential.

Power consumption of elevator is:

- The average power of elevator is less than 10% of to all building's electric consumption annually.
- The elevator is consuming 250watts power lift the object /person.
- **In my project** we use 0.5 hp motor if has output power of $0.37\text{kw} \approx 370\text{w}$ (1-4p)
- Lift consumes both 1-4 p and 3-4ppower for brake gear we 1-p power. Speed of the lift elevator usually most of the elevator are designed to travel at a 100 – 500 feet per minutes between 1.14 to 5.27 miles/ hour.
- For 10 star or less • Potential maximum speed of elevator is 0.15 m/second

As per size the maximum floor to floor height in a residential building should at least 1.66 free Technology for safety device rack and pinion mechanism.

- Reaction time for operation of safety device.
- From: 2 = ½ second, 1 = 1 second.

Cable carrying capacity:

- Type of material – stain less steel
- Diameter = 5mm.
- Rope length = 2 meters
- Rope capacity = 40k

Type of material – stain less steel

- Cable carrying capacity:
- Diameter = 5mm.
- Rope length = 2 meters
- Rope capacity = 40k

4.ADVANTAGES

Safety brakes, easiest method of any heavy weightlifting. Most applicable for safety system in heavy load lifting condition. It is used for small- and large-scale industries. Cost is low on fabricate system. Carrying large items or heavy loads up the stairs is often quite a big task. It can be tiring difficult, time consuming and most of all

dangerous. Anelevatorprovidesanefficientand convenient solution to transporting goods with ease, Including the weekend grocery that you shopped, luggage, prams, laundry, rubbish, and so much more.

5. CONCLUSION

New digital technologies offer enormous opportunities for interpersonal communication and improvements in myriad dimensions of urban life, including people's vertical movement in increasingly towering structures for living and working. Megamall buildings amplify the challenges in all aspects of elevator design for both technology and passenger experience. The goal of vertical transportation systems in mega tall buildings should be to provide a natural interaction with the building ecosystem for a safe, efficient, convenient, and personalized passenger experience, balancing advances in elevator and building performance to provide a delightful ride every time.

ACKNOWLEDGEMENT

An Endeavour over a long period can be successful only with an advice and support of many well wishes. We take this opportunity to express our deep gratitude and appreciation to all of those who encouraged us for successful completion of the Project work. Our special thanks to our Principal Dr. V. Ravi Prasad, and vice-principal Mr.K.Viswaksena Reddy who has provided all the required facilities and helped in accomplishing the Project within time. We are thankful to Head of the Department Dr. B.V Krishnaiah, for his valuable guidance and efforts towards the Project. We are thankful to my Guide Mr. SEKHAR, Assistant Professor for the valuable guidance and efforts throughout the Project. Finally, we would like to extend my deep sense of gratitude to all the staff members, friends and greatly indebted to our parents who inspired me at all circumstance.

REFERENCES

1. Auditees P. The hydrogen elevator, a world first by Otis in Given. Synoptist news brief. Jul 5, 2007. http://newsbrief.synoptos.com/fileuploads/L'ascenseur_%C3%A0_hydrog%C3%A8ne_EN.pdf.
2. Christensen CM. The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business. New York: Harper Business; 2011.Gravois J. Going Up: An Informal History of the Elevator from the Pyramids to the Present. 1st ed. Farmington CT: Otis Elevator Company; 1983
3. Goodwin J. Otis: Giving Rise to the Modern City. 1st ed. Chicago: Ivan R. Dee; 2001.