Elevator Guide Rail Handling Device  
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Sponsor: Kone  
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Problem Statement

- Design a device to handle and manipulate elevator guide rails  
- Move multiple rail sections at a time for installation  
- Lift the sections to an efficient working height  
- Ideally manually operated with one installation mechanic working alone  
- Device to have a lifetime of at least 50 elevator installations

Solution

- Customize and implement a heavy duty scissor lift  
- Enhance efficiency, safety, and ergonomics

Guide Rails

- Can weigh up to 300 lbs.  
- Can measure up to 16 ft.  
- Hundreds of Rails per job  
- Almost 140,000 per year  
- Difficult to maneuver

Current Method

- Rails are loaded onto a small dolly and rolled to staging area  
- Some drilling may be required and done so on the ground  
- Each rail is lifted onto a set of saw horses to be cleaned  
- Rails are removed from saw horses and individually transported to hoist-way via small dolly

Proposed Method

- Rails are loaded onto scissor lift device from the side, one end at a time and taken to staging area  
- Installer use a manually operated foot pump to raise beams to effective work height  
- Preparation is done easily at ergonomic height  
- Rails are lowered with hand release and transported to hoist-way by swivel casters  
- Extend legs increase foot print for stability while carrying larger beams  
- Beams can be unloaded by means of a conveyor roller attached to cart

Results and Conclusions

Ergonomic Improvements

- Improved Working Surface  
- Decrease In Worker Movement  
- Decrease In Manual Lifting  
- 50% Reduction in Bending Motion

Cost and Labor Savings

- $41,179 Annual Savings  
- Nearly 600 Miles of Manual Lifting/Carrying Saved Per Year  
- Increased Efficiency

Fabrication

Extensive metal and fabrication work was done by team members including:

- Welding  
- Metal Cutting  
- Lathe Operation  
- Drill Press Operation  
- Painting

Contact Information

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