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## **DESIGN AND FABRICATION OF HYDRAULIC LIFTING CRANE WITH LOAD DISPLAY**

***Prof. Praful Randive, Mukul Dahekar, Mortate Maroti, Pandit Kamesh, Pramod Suryawanshi, Samir Sikandar Sheikh***

Mech. Engg. Dept AGPCE Nagpur

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### **ABSTRACT:**

This project deals with the fabrication of Hydraulic floor crane. The aim of this project work is to acquire practical knowledge in the field of material handling equipment with the help of hydraulic principle. This machine is very useful for lifting and transporting heavy jobs up to 3 kg for all types of jobs such as automobile repairs and service shops of central workshops, production industries, material handling units etc. In material handling, the cranes play a vital role in modern manufacturing industries. In our project we aim to fabricate a hydraulic operated floor crane for handling various kinds of materials. The hydraulic floor crane consists of truck, hydraulic cylinder, hydraulic tank, hydraulic hoses, DCV, beam and hooks.

Keywords: Weather Prediction, forecast accuracy

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### **Introduction:**

#### **1. INTRODUCTION -**

A crane is a type of machine, generally equipped with a hoist rope, wire ropes or chains, and sheaves, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. It uses one or more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a human. Cranes are commonly employed in the transport industry for the loading and unloading of freight.

The development of lift machine or crane has reached through different time starting the first crane for lifting heavy load was invented by ancient Greeks in the late 6th century BC. The heydays of crane in ancient times come during Roman Empire when construction activity soared and buildings reached enormous dimensions.

By considering all these factor we try to make specially type hydraulic crane used for shifting of material from one place to another.

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#### **2. Literature review -**

***1)IJRET: International Journal of Research in Engineering and Technology eISSN: 2319-1163 | pISSN: 2321-7308 ,A REVIEW: FLOOR CRANES FOR INDUSTRIAL USE***

In day today Industrial practice material handling is a important phenomenon and can be defined as handling, movement, storage and control of materials or equipment's throughout the entire process of manufacturing and in between the various process which are necessary to create a finish good. As a process material handling incorporates a wide range of manual, semi-automated and automated tools and equipment's. In a manufacturing unit material handling equipment is designed on basis of specific need, nature of work, ergonomics, space utilization and life cycle cost. Equipment's such as powered trucks, Conveyors, pallets, hoists, cranes etc. are some of the commonly used material handling devices in industries. For moving load over a short distance cranes are the most effective type of material handling system and can be used for heavy loads also. These material handling cranes can be movable or fixed type. A movable crane are flexible and economical way of moving the material from one place to another and requires a manual control.

***2)Vol-3 Issue-3 2017 IJARIE-ISSN(O)-2395-4396, "HYDRAULIC CRANE"***

Cranes do play the most vital role in the manufacturing industries. In this project we aim to create a machine that reduces man power that is additional. This hydraulic floor crane consists of Base truck, hydraulic jack, wheels, hydraulic hoses, levers, direction control valve, horizonatal beam and hooks. There the beam is placed vertical can also called as support arm. is connected to the base plate and the hydraulic jack touching the hook used to lift the heavy industrial load. The hydraulic jack is lifted or operated outward with the help of reciprocating movement of lever connected to the hydraulic jack.

The crane is fabricated with complete clear front, small compact frame, good reach, high lift and with low center of gravity. The crane has the capacity of lifting 10 kg with wide spread application in the shop floor. Thus the floor crane would serve

3) International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-3, Issue-2, December 2013 , Optimization in Design of Rotating Hydraulic Crane

The main aim of the project is the design, analysis and production of a hydraulic floor crane having arm motion in the vertical as well as horizontal plane with 180 degree rotation.

These hydraulic floor cranes provide an efficient, low cost alternative to other material handling equipments. Strong, robust, sturdy and built to very standard, these cranes are maneuverable in loading, unloading and shifting of heavy loads. Crane structure consists of chassis, vertical column, horizontal arm, and the hydraulic pump with cylinder assembly. The box crane can take heavy loads effectively, avoids damage under rough and unskilled handling. The hydraulic cranes used in the industry are efficient but they only have the ability to lift the load and put it down at some other position. In this general design, the arm of the crane moves in the vertical plane only, i.e it has constrained motion. The aim of our project is to re-design the hydraulic crane and give its arm the rotational ability

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### 3. Problem Definition -

The aim of the project is to develop a semiautomatic portable hydraulic crane to avoid the manually effort. The objective of this work is to decrease the time required in transfer of material from one place to another thus it will be supportive for industrial sector.

To design analytically the portable lifting machine lift slightly heavy objects that can't be carried by single worker

To minimize cost expenditure for fuel that is made for operating fork lift in transporting every component in the production shop

Specifically in bus production factory to minimizes wastage of time due to each station should wait for a single crane for lifting

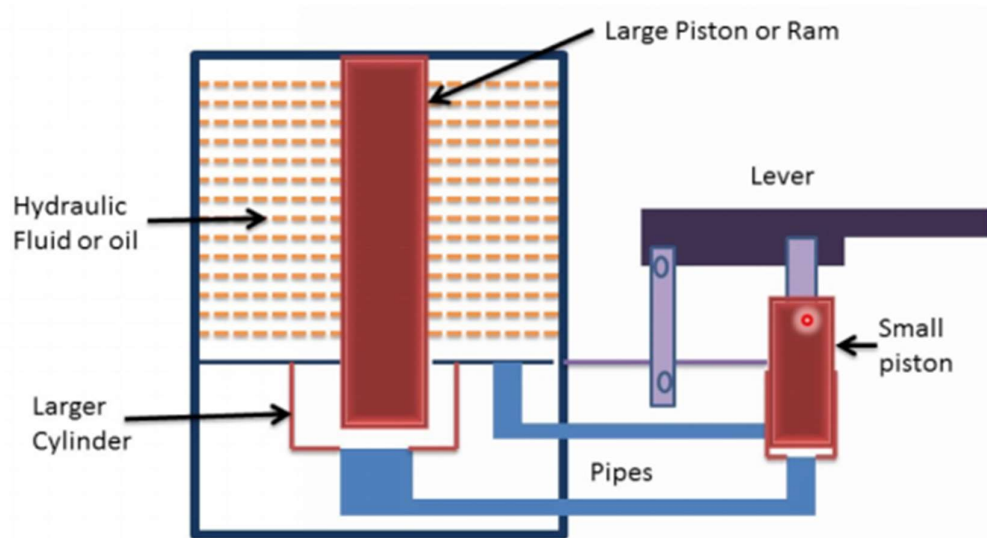
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### Proposed Methodology of solving identified problem :

- To design analytically the portable lifting machine lift slightly heavy objects that can't be carried by single worker
- To minimize cost expenditure for fuel that is made for operating fork lift in transporting every component in the production shop
- Specifically in bus production factory to minimizes wastage of time due to each station should wait for a single crane for lifting
- To minimize risk of life and property
- To produce the working prototype of portable, moveable crane for the production shop
- To determine the overall cost of the crane production • •Finally, to documentation of the research project
- Modified the existing mechanisms.
- To solve the material handling problems.



IMAGE OF HYDRAULIC LIFTING CRANE



Block diagram



Invented Project photo

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**Parameters to analysis :**

{1} Time

Human body can manually lift maximum weight 30kg to 34kg as per distance and it takes time.

{2} size

its cover 3.3ft\*3.3ft body size of any object and carry without any trouble

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**4. Expected outcome -**

- it can sustain weight 1ton to 1.5ton, its reduce time and human effort.
- easily weight transportation from one place to another place,easy to handle for aground level work in any industries its envirmntally free and manually handling.

	<b>Human</b>	<b>Machine</b>
Lifting capacity ( kg/ton )	Nearby 30-35kg max	Only 1000-1500kg min

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**CONCLUSION:**

- The aim of our project was to build a fully functional HYDRAULIC FLOOR CRANE mechanism which is capable of lifting load up to 2 tonne . We accurately achieved our first goal of lifting the load and 360° rotary motion of the vertical column .
- We feel that our design and fabrication was a great success both in terms of strength and stiffness. Our project weighed 50kg which is capable of lifting load up to 2 tonne using hydraulic power.

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