

Quick Lifting Jack with Bevel Gear

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Abstract –

This This project work titled “fabrication of quick lifting jack with gear arrangement” has been conceived having studied the difficulty in lifting the any type of light vehicles. Our survey in the regard in several automobile garages, revealed the facts that mostly some difficult methods were adopted in lifting the vehicles for reconditioning. Now the project has mainly concentrated on this difficulty, and hence a suitable device has been designed. Such that the vehicle can be lifted from the floor land without application of any impact force. The fabrication part of it has been considered with almost ease for its simplicity and economy, such that this can be accommodated as one of the essential tools on automobile garages.

Key Words: optics, photonics, light, lasers, stencils, journals

1. INTRODUCTION

This document shows the suggested format and appearance of a manuscript prepared for SPIE journals. Accepted papers will be professionally typeset. This template is intended to be a tool to improve manuscript clarity for the reviewers. The final layout of the typeset paper will not match this template. The use of a rapid lifting jack with a bevel gear arrangement allows for the lifting of large weights from the top to the bottom and vice versa. A quick-lifting jack with a bevel gear arrangement serves the same purpose as a screw jack.

It is used to move the weights up and down, back and forth. Bevel gears, as opposed to the worm gears used in screw jacks, are used in this design. This set up offers some advantages over a screw gauge. When fully loaded, it can support a load of up to 150 kg. Here, we primarily concentrate on enhancing the cost-effectiveness, load carrying capability, and other properties of screw jacks. The amount of manual labour required versus a standard screw jack is out.

2. Material Required

Therefore, quick lifting jack with bevel gear arrangement has lower manufacturing cost than a standard screw jack

COMPONENT	REQ NOS
Angle Rods	5
Ball Bearing	2
Filter Rods	8
Metal Rods	3
Screw	1
Bevel gears	2

Bevel gears

The axes of the two shafts cross in bevel gears, and the gears' tooth bearing faces have a conical form. Although they can be made to operate at other angles as well, they are typically placed on shafts that are 90 degrees apart. In this setup, bevel gears function as the lifting heart.

Metal rods

The stand for the arrangement in this case is constructed out of metal rods. Here, the necessary stand is constructed using 9 metal rods.

Angle rods

Here, the stand is supported by angle rods.

Ball bearing

A form of rolling-element bearing known as a ball bearing uses balls to keep the distance between the bearing races constant.

SCREW

Here, a screw is mostly employed for up-and-down movement.

3. FABRICATION:

A tool called a rapid lift jack is used to lift heavy objects with significantly less force can be used to explain the rapid lift jack's operating concept. Many additional technological developments, including dental chairs and quick-lift jacks, function. Handle is used to rotate the bevel gear arrangements. Lifting rod will be fixed to bevel gear under the jack arrangement. Jack will move upward and downward when the handle is rotated

both clockwise and counter clockwise. During usage, the screw jack is assembled for operation with extended properly. The jack is then placed perfectly under the vehicle with loading platform serving as a base for support. functions as the effort that aids rotation During the process of lifting rotates in clockwise direction allowing rotate as well (engaging gearing motion) which aids in the upward movement The reverse is the case when it is turned counter clockwise, allowing downward movement of thereby lowering the load. Doing all these like the conventional jack the operator must carefully inspect the operation making sure the load sits perfectly on the loading platform to prevent unsafe conditions i.e. slippage of the vehicle from the jack.



Fig. 1 Quick Lifting jack

4. WORKING

To lift huge weights from top to bottom and vice versa, a quick lifting jack with a bevel gear arrangement is employed. The function of a quick-lifting jack with a bevel gear arrangement is identical to that of a screw jack. It is used to lift the weights back and forth from the bottom to the top. In this setup, bevel gears are utilised rather than the worm gears used in screw jacks. The stand that is kept above the bolt or screw is where the working load is put. Manual rotation of a shaft-connected vertical or tiny bevel gear is required. The horizontal or large gear rotates in the opposite direction when the little gear does. Therefore, the screw jack goes downhill when the shaft is rotated in the opposite direction of clockwise rotation. The screw jack moves higher when the shaft is rotated clockwise. It can be utilised for lifting. The screw jack, bearing, and both gears should all be greased. In contrast to a typical screw jack, the manual power provided here is more constant. Therefore, this is regarded as the fundamental benefit of this arrangement.

6. TEST

Lifting heavy objects from top to bottom and vice versa is the principal function of a quick lifting jack with a bevel gear arrangement. Compared to standard screw jacks, it is less complicated and more affordable. As

opposed to standard screw jacks, this method doesn't require a lot of physical labour. When compared to standard screw jacks, this setup does not harm the screw threads as quickly.

7. APPLICATION

- The bevel gear is used in a wide variety of devices, including locomotives, ships, cars, printing presses, cooling towers, steel mills, power plants, and track inspection equipment for railways.
- Although the shafts are typically at right angles in most applications, bevel gears can be used to link shafts whose axes are at an angle.
- With the exception of the tooth getting smaller as it comes closer to the apex of the projected cone, the tooth profile is essentially the same as that used for spur gears.
- Bevel gears are used in power transmission systems to change the direction of a shaft's rotation, as well as to slow down a spinning shaft and increase its torque.
- They are used on shafts with intersecting axes and, in particular, on shafts with non-crossing axes.
- Conveyor belt systems are powered by bevel gears as well as other kinds of gearing.
- Furthermore, parallel shafts and bevel-helical gear shafts are the most typical gearbox designs utilised in chain conveyors.
- One of a pair of gears with cone-shaped pitch surfaces that joins two shafts with intersecting axes.
- Along the pitch cone, teeth are carved. a straightforward type of bevel gear with straight teeth that, if they were extended inward, would converge at the intersection of the shaft axes.

8. CONCLUSIONS

As opposed to standard screw jacks, this method doesn't require a lot of physical labour. When compared to standard screw jacks, this setup does not harm the screw threads as quickly. It has the greater lifespan. It can bear a large amount of weight. It doesn't need to be lubricated frequently. Its construction is incredibly straightforward when compared to hydraulic and pneumatic systems. When compared to both systems, it weighs less. The bevel gear design of the quick lifting jack makes it exceedingly portable.

9. ACKNOWLEDGEMENT

We would like to give our thanks to Prof.V.R.Ranavare for his valuable guidance throughout the projects.

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