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Fabrication Of Quick Lifting Jack With Bevel Gear

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ABSTRACT

You can utilise a quick-lifting jack with a bevel gear configuration for lifting. 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. Bevel gears are used in this setup rather of the worm gears that were used in screw jacks. Compared to a screw gauge, this setup has some benefits. The highest load it can support is around 2000 kg. Pneumatic screw jacks, hydraulic screw jacks, and conventional screw jacks are all replaced by this arrangement. The major goals of this setup are to increase screw jacks' load carrying capacity, reduce costs, and get around various other challenges. The challenges with screw jacks are that they are expensive and need constant lubrication. This can be used in lifting cars, trucks, buses, and many other types of vehicles, as well as in industrial settings. 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. Construction- wise, it is fairly straightforward compared to pneumatic and hydraulic systems. Pneumatic systems need air compressors, and hydraulic jacks use cumbersome cylinders and hydraulic fluids. When compared to both systems, it weighs less. The bevel gear design of the quick lifting jack makes it exceedingly portable.

Keywords: Bevel. Lubrication, Threads, Jacks, Load.

I. INTRODUCTION

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 that were utilised in screw jacks Compared to a screw gauge, this setup has some benefits. It can support a load of up to 150 kg at its utmost capacity. Here, we focus mostly on improving screw jacks' cost-effectiveness, load carrying capacity, and other aspects. When compared to a typical screw jack, the amount of manual power provided here does not vary as much. Therefore, this is regarded as the fundamental benefit of this arrangement. Bevel Gear Ball Screw Jacks employ a ball screw and nut constructed from hardened alloy steel with hardened bearing balls carrying the load between the nut and the screw providing smooth and efficient movement of the load. The main advantage of bevel gear jacks is that they have lower ratios, which leads to higher speeds and travel rates, and are more efficient than worm gearing—up to 60% as opposed to 20%. Ball screws are also included with bevel gear jacks, significantly boosting their capacity for efficiency and speed.

II. EMPATHY

- There are some challenges with screw jacks. The following is a list of them.
- The worm gear in a screw jack means that it needs to be lubricated frequently
- Compared to bevel gears, it causes screw thread damage more quickly.
- In contrast to this setup, it is more expensive.
- Filling working fluids into hydraulic screw jacks requires doing so for a predetermined amount of time.

III. DEFINE

MATERIALS REQUIRED

COMPONENT	REQ NOS
ANGLE RODS	5
BALL BEARING	2
METAL RODS	3
FILLER RODS	8

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

IV.PROTOTYPE (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.

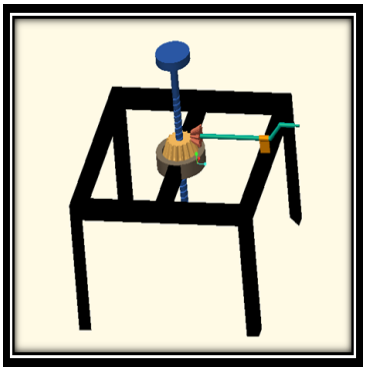

FIGURE 1

V.TEST (EVOLVE)

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.

VI.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.

CONCLUSION

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.

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