



WI-FI BASED JACK AUTOMATION SYSTEM USING ESP8266 NODE MCU

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ABSTRACT :- With the growing levels of technology, the efforts being put to produce any kind of work has been continuously decreasing. The efforts required in reaching the desired output can be effectively and economically be decreased by the implementation of better designs. Power screws are used to convert rotary motion into interpreter movement. A screw jack is an illustration of a power screw in which a little power applied in a level plane is utilized to raise or lower a huge burden. The guideline on which it works is like that of a slanted plane. The level of the jack is changed by turning a lead screw and this change should be possible by incorporating an electric engine. A jack is mechanical gadget used to lift weighty loads or apply incredible powers. Jacks utilize a screw string. A mechanical jack is a gadget which lifts weighty gear. The most widely recognized structure is a vehicle jack, floor jack or garage jack which lifts vehicles so that maintenance can be performed. Car jacks usually use mechanical advantage to allow a human to lift a vehicle by manual force. As our area of concern is a screw jack used for lifting the car that is scissor jack, so only the scissor jack, this can be controlled through mobile phone using Wifi technology without Internet.

I. INTRODUCTION

Screw type mechanical jacks were very common for jeeps and trucks of World War II vintage. For example, the World War II jeeps (Willys MB and Ford GPW) were issued the "Jack, Automobile, Screw type, Capacity 1 1/2 ton", Ordnance part number 41-J-66. This jacks, and comparable jacks for trucks, were enacted by utilizing the drag wrench as a handle for the jack's fastener activity to of the jack. The 41-J-66 jack was conveyed in the jeep's apparatus compartment. Screw type jack's gone on being used for little limit prerequisites because of minimal expense of creation raise or lower it. A control tab is increased/down and its position decides the heading of development and basically no upkeep. There is proof of the utilization of screws in the Ancient Roman world yet it was the incomparable Leonardo da Vinci, in the late 1400s, who first demonstrated the use of a screw jack for lifting loads. Leonardo's design used a threaded worm

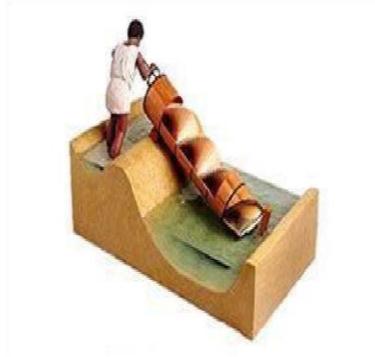


Figure. 1 Traditional Jack

gear, supported on bearings, that rotated by the turning of a worm shaft to drive a lifting screw to move the load - instantly recognizable as the principle we use today. Meanwhile, in Allegheny County near Pittsburgh in 1883, an enterprising Mississippi river boat captain named Josiah Barrett had an idea for a ratchet jack that would pull barges together to form a „tow“. The idea was based on the familiar lever and fulcrum principle and he needed someone to manufacture it. That person was Samuel Duff, proprietor of a local machine shop [8].

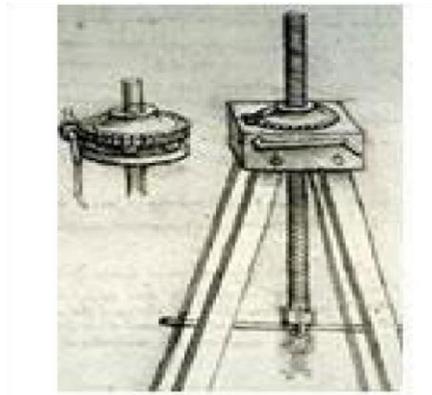


Figure- 2 Barrett Jack

Together, they created the Duff Manufacturing Company, which by 1890 had developed new applications for the original, Barrett Jack and extended the product line to seven models in varying capacities.

II. BLOCK DIAGRAM

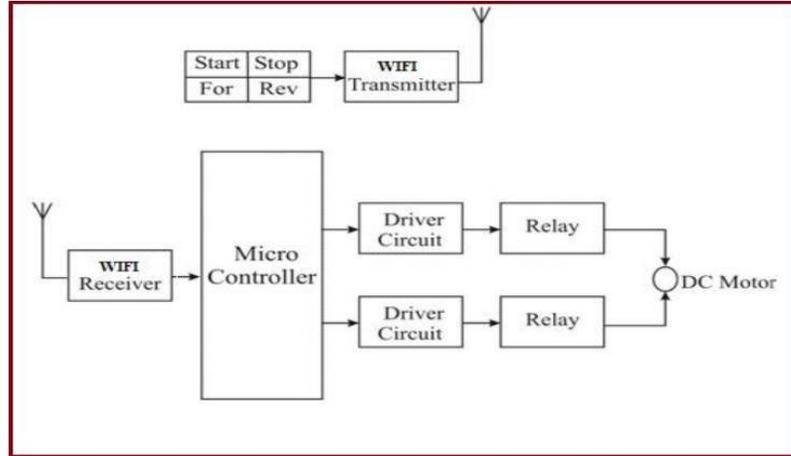


Fig. 3- Block Diagram

2.1 LIST OF COMPONENTS

Sr No.	Items	Unit Cost	Total
1.	ESP IoT Kit	1x 2250	2250
2.	Relay	2x250	500
3.	Model Design	1x1400	1400
4.	DC Motor	1x 850	850
5.	Jack	1x 1450	1450
6.	DC-DC Convertor	1x850	850
7.	Wires	20x2	40
8.	Connectors and Jumpers	50x4	400
9.	Others	2800	2800
Total Cost			10540

a) ESP8266 Node MCU

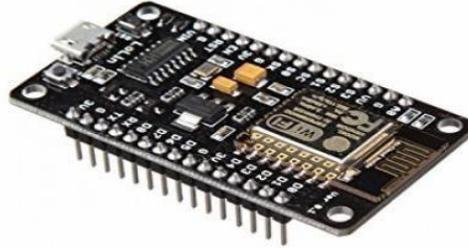


Fig. 4- ESP8266 Wifi NodeMCU Module

NodeMCU is a IoT Module based on ESP8266 wifi Module. NodeMCU uses Lua Scripting language and is an open source Internet of Things (IoT) platform. This modules has CH340g USB to TTL IC [9].

A wind

b) DC MOTOR



Fig. 5- DC MOTOR

Typical brushless DC motors use one or more permanent magnets in the rotor and electromagnets on the motor housing for the stator. An engine regulator changes DC over completely to AC.. Benefits of brushless engines incorporate long life expectancy, almost no upkeep, and high effectiveness. Hindrances incorporate high starting expense, and more muddled engine speed regulators. Whatever brushless engines are some of the time alluded to as "coordinated engines" despite the fact that they have no outside power supply to be synchronized with, as would be the case with normal AC synchronous motors. This DC Motor – 10RPM – 12Volts can be used in all-terrain robots and a variety of robotic applications. These motors have a 3 mm threaded drill hole in the middle of the shaft thus making it simple to connect it to the wheels or any other mechanical assembly.



A scissor jack has four main pieces of metal and two base ends. The four metal pieces are all connected at the corners with a bolt that allows the corners to swivel. A screw thread runs across this assembly and through the corners. As the screw thread is turned, the jack arms travel across it and collapse or come together, forming a straight line when closed. Then, moving back the other way, they raise and come together. When opened, the four metal arms contract together, coming together at the middle, raising the jack. When closed, the arms spread back apart and the jack closes or flattens out again.

III. CONCLUSION

Scissor jacks are the ideal product to push, pull, lift, lower and position loads of anything from a couple of kilograms to hundreds of tons. The need has long existed for an improved portable jack for automotive vehicles. It is highly desirable that a jack become available that can be operated alternatively from inside the vehicle or from an area of security off the street on which the vehicle is found. Such a jack ought to alluringly be sufficiently light and be conservative enough so it very well may be put away in an auto trunk, can be lifted up and conveyed by most grown-ups to its place of purpose, but be fit for lifting a wheel of a 4,000-5,000-pound vehicle off the ground. Further, it ought to be steady and effectively controllable by a switch so that jacking should be possible from a place of wellbeing. It ought to be effectively portable either to a situation under the hub of the vehicle or some other built up help surface intended to be locked in by a precisely progressed scissor jack. This paper ended up being most important concerning cooperation and make duement to us. Also, we explored new territories in technical creation. We faced new challenges while designing and analyzing scissor jack. The experience gained has provided us confidence in dealing with practical aspects of engineering and will prove to be invaluable for future mechanical advancement.



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