

# Design and Analysis of Broken Pipe Lifting Mechanism

P. Naveenkumar<sup>1</sup>

<sup>(1)</sup> Asst. Professor ,

Department of Mechanical Engineering ,  
Hindusthan Institute of Technology , Coimbatore-32.

**Abstract:-** Our previous methods of bore and pipe taking equipment's are different from our concepts. This unique method is used for finding the pipe from the bore water. It is not so easy to find out. But we can solve the problem by using new and unique concept. With the help of our concept pulley with spring operated chuck with object locked technology is only possible method. By the concept our machine reaches the pipe exactly and locks the top of the pipe with the help of spring and chuck easily and quickly. Then it's possible to carry out easily

## INTRODUCTION

Bore wells are deep and the submersible pump is at the bottom of the long bore well pipe. Conventionally the bore well pipe and pump are lifted out of the bore well using which and pulley block. This is a very time consuming and laborious work. The bore well pipe lifter and transportation machine gives more than 3m /min transfer rate which makes the mounting and dismounting of the submersible pump in bore wells very fast and very easy. So that the total integrated information and steps to be followed during Bore well installation and lifting is to be focused. In the ancient days these process carry out with the help of chain pulley mechanism. This method is traditional method and very time consuming.

This chain pulley mechanism also required no of labour to carry out the process. The main purpose behind this project is to lift the pump and motor in less time and human efforts with very simple and convenient mechanism. The additional benefit of this project is to lift anything fall down in the bore (child, any object). To design development of three roller holding mechanism for pipe lifting.

## DESCRIPTION OF EQUIPMENTS

### I. SPRING

A spring is an elastic object that stores mechanical energy. Springs are typically made of spring steel. There are many spring designs. In everyday use, the term often refers to coil springs.

When a conventional spring, without stiffness variability features, is compressed or stretched from its resting position, it exerts an opposing force approximately proportional to its change in length (this approximation breaks down for

larger deflections). The rate or spring constant of a spring is the change in the force it exerts, divided by the change in deflection of the spring. That is, it is the gradient of the force versus deflection curve.

Springs are made from a variety of elastic materials, the most common being spring steel. Small springs can be wound from pre-hardened stock, while larger ones are made from annealed steel and hardened after fabrication. Some non-ferrous metals are also used including phosphor bronze and titanium for parts requiring corrosion resistance and beryllium copper for springs carrying electrical current (because of its low electrical resistance).

A pipe is a tubular section or hollow cylinder, usually but not necessarily of circular cross-section, used mainly to convey substances which can flow

— liquids and gases (fluids), slurries, powders and masses of small solids. It can also be used for structural applications; hollow pipe is far stiffer per unit weight than solid members.

In common usage the words pipe and tube are usually interchangeable, but in industry and engineering, the terms are uniquely defined. Depending on the applicable standard to which it is manufactured, pipe is generally specified by a nominal diameter with a constant outside diameter (OD) and a schedule that defines the thickness. Tube is most often specified by the OD and wall thickness, but may be specified by any two of OD, inside diameter (ID), and wall thickness. Pipe is generally manufactured to one of several international and national industrial standards.[1] While similar standards exist for specific industry application tubing, tube is often made to custom sizes and a broader range of diameters and tolerances. Many industrial and government standards exist for the production of pipe and tubing. The term "tube" is also commonly applied to non-cylindrical sections, i.e., square or rectangular tubing. In general, "pipe" is the more common term in most of the world, whereas "tube" is more widely used in the united states.

Both "pipe" and "tube" imply a level of rigidity and permanence, whereas a hose (or hosepipe) is usually portable and flexible. Pipe assemblies are almost always constructed with the use of fittings such as elbows, tees, and so on, while tube may be formed or bent into custom configurations. For materials that are inflexible, cannot be formed, or where construction is governed by codes or

standards, tube assemblies are also constructed with the use of tube fittings.

## II. PIPE

A pipe is a tube hollow cylinder used to convey materials or as a structural component. The terms pipe and tube are almost interchangeable. A pipe is generally specified by internal diameter (ID) whereas a tube usually defined by the outside diameter but may be specified by any combination of dimensions (OD, ID, wall

thickness). A tube is often made to custom sizes and may often have more specific sizes and tolerances than pipe. Also the term tubing can be applied to non-cylindrical shapes (i.e. square tubing). The term tube is more widely used in the United States, whereas pipe is more common elsewhere in world.

Both pipe and tube simply a level of rigidity and permanence whereas hose is usually portable and flexible. Pipe may be specified by standard pipe size designations nominal pipe size or by nominal, outside, or inside diameter and wall thickness. Many industrial and government standards exist for the production of pipe and tubing.

## III. COUPLING

A coupling is a device used to connect two shafts together at the ends for the purpose of transmitting power. Coupling do not normally allow disconnection of shafts during operations, however there are torque limiting couplings which can slip or disconnect when some torque limit is exceeded.

The primary parts of couplings is to joint two pieces of rotating equipment while permitting some degree of misalignment or end movement or both. By careful selection, installation and maintenance of made in couplings, substantial savings can be made in reduced maintenance cost and down time.

In a more general context, a coupling can also be a mechanical device that serves to connect ends of adjacent parts are objects.

## WORKING PRINCIPLE

This is simple concept of lifting any other materials easily. Construction of Frustum cone shaped pipe holder consists of hinge, spring. Frustum cone having four sections with four spring and hinge is to holder pipe tightly to lift from bore well. Shape and dimension of lifting.

Pipe taking setup is unique technique to take out from bore well without electrical power. Light and medium weight pipe only can be lift out by this method. Gripping power depends on stiffness of spring.

## DIAGRAM

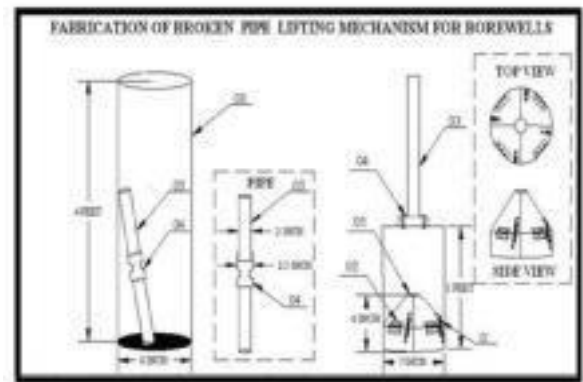


figure 1

## ADVANTAGES AND DISADVANTAGES

### ADVANTAGES

- Easy to operate
- Easy to rescue
- Slow and safety operation

### DISADVANTAGES

- Manual lifting system.

### APPLICATIONS

- Applicable in bore well
- Used in oil industries.





### CONCLUSION

This project is made with pre planning, that it provides flexibility in operation. This innovation has made the more desirable and economical. This project “**BROKEN PIPE LIFTING MECHANISM**” is designed with the hope that it is very much economical and help full to constructional areas and some industries. This project helped us to know the periodic steps in completing a project work. Thus we have completed the project successfully.