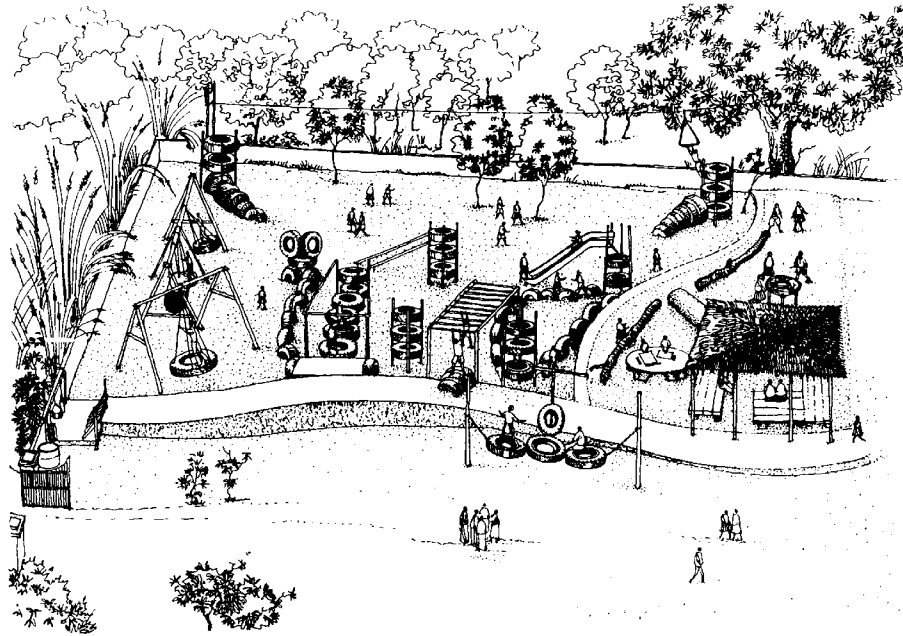


# ENTYRELY FUN PLAYGROUNDS

JAMES A. JOLLEY



Text by James A. Jolley  
Illustrations by Vishwas Thoke

This book is being put in the public domain in the memory of Jimmy Jolley.  
Jimmy worked ceaselessly all his life for children – specially the poor.  
His life will always be an inspiration to us.

## DEDICATION & ACKNOWLEDGEMENT

I would like to thank the following individuals and organizations those have helped in the development of many of the ideas shared here (if not adapted almost all right from some of their original designs).

First there are such creative individuals as Paul Hogan, Willie Weisz, Chris Clews, Prue Walsh and Bob Leathers who have done much to expand my knowledge in the development and use of tires as a low-cost and safe material for playground construction. I hope each of you will forgive my liberal adaptation and use of many design characteristics I have used throughout this book (I am sure each of you will recognize where I have borrowed from each of your ideas!) I would also like to acknowledge the Bernard Van Leer Foundation for the design elements from their handbook of low-cost playground additions.

I would like to offer many thanks to Srijan \* – primarily Ruth and Dinesh Rastogi - for providing space, time and support (of all kinds) to actually bring this manual together.

Finally I would like to thank two very special people for just supporting me and telling me that I could do this. First is my daughter Serene whom I will love always and the second is Susan who has cone into my life and I hope that I can support her emotionally as much as she has done me.

\*Srijan is a no-profit N.G.O. in India working to bring about change in the educational system by introducing and supporting developmentally appropriate educational philosophy and earth friendly environmental education for young children.

## PREFACE

In my role as a Planner and Designer of Children's environments, I have been primarily interested in the design and implementation of outdoor spaces for children. Following the traditions of Paul Hogan and his ideas put forth in his book, "Playgrounds for Free" I have tried to use low-cost techniques and recycled materials in the building of these play environments.

In parts of the world where providing funds for children's play environments may not have a high priority it becomes even more important to use locally available resources that have a low-cost with reasonable durability so that interactive play / learning environments can be provided. Towards this goal and in conjunction with the experience I have gained working with and in a number of varied cultural settings – I

have put together the following ideas to help interested parties provide easily constructed playground equipment choices that cover a wide range of play behaviors, ages and choices for activity spaces in any environmental setting - be it a crèche, kindergarten, primary or local community park. The ideas contained within can be easily adapted to almost any criteria and budget.

All children need safe stimulating places to interact with all the elements of their environment. In a truly enlightened community, importance is placed on the growth and development in positive ways of all the members of the society and community. This not only helps children meet their full potential as human beings but ensures that a community society stays strong and healthy, not only physically but, emotionally and intellectually as well. In the case of children where “through play” they make sense of their constantly evolving and changing world it becomes even more important to give them positive messages of how they are viewed in the larger community. By giving them rich and varied environments that allows them to explore as individuals, and as a group, their own innate potentials the message that they receive is one of concern and respect. A respect that is returned to the good of society by an adjusted and secure member of that society.

I hope the following ideas will help groups and individuals in communities, schools and child care facilities that feel as I do that play and the joy of childhood is a right of all children and can be done in ways that provide positive growth for both the child and the community they exist in.

### USING TIRES

This book is going to be about using basically one main material in the construction of playgrounds – TIRES. Tires - I love tires those symbols of our advanced technology that make our lives easier but can be such an eyesore when we are through with them. The funny thing is that this is mostly a problem in “western” countries. In other cultures tires rarely end up as a waste problem they are constantly recycled by recapping them or cutting them up into other useful items until there are only small bits left.

Technologies have been developed those use old tires in many new ways. I came across a builder that was using tires to build extra thick walls for houses in Australia and came across another person who was

cutting tires into strips and using them as roof tiles. I have come up with hundreds of ways to use old tires that stem from memories of finding tires as a boy.

Like I remember back to lazy childhood days and the joy of swinging under the shade of a big tree on the side of the house. How many people don't have a nostalgic memory of their first swing hung up off an odd piece of rope tied to the limb of a tree and an old car tire suspended vertically from it. This creates a simple and effective seat swings (if somewhat uncomfortable it is still quite functional).

I also remember finding an old large tire lying in the tall weeds and discovering the way it rolled and, when sent off down a steep and bumpy hill, the way it bounced and jumped down the hill. I loved getting inside it and with it. Making discoveries from something as simple and functional as an old tire was great fun.

I have been helping communities / schools all over the world to plan and implement children's outdoor play environments, in as low-cost a way as possible. I have often encountered situations where about the only readily available resource material to use is one of the products we most depend on when it is new but have very little use for when it has been worn out.

Tires are a waste disposal problem throughout the world - they do not recycle easily (especially the steel belted ones and they tend to pop up out of the ground when placed into landfills if not cut up to release the air trapped inside then.

It has also been estimated that most tires have a half-life of about three hundred years and possibly longer when placed in the relative bacteria free environment of a landfill - making the area unusable for a much greater period of time.

As a resource material for the use of playground equipment there are many advantages beyond the message we could give to our children about the value we place on protecting our environment by finding appropriate ways to re-use this " waste " product as functional and safe playground equipment.

In my work as a designer and builder of community built play environments, I have identified about 280 uses for all types of old tires. In an ideal world it would be nice to use only non-steel belted radials so as to not take any chance that the outside rubber will wear away and expose the potentially hazardous steel wire belting underneath. But the

reality is that the non-steel variety is getting harder and harder to find and the steel belted radials are increasing.

Let's take a quick look though at one of the reasons it has been suggested that steel belted radials not be used. It is the one mentioned above about the rubber wearing away and exposing the steel belting underneath.

I guess my question is - can even protracted and excessive use by children's hands and feet ever match the intended friction and wear designed for a tire by it's being used on a car or a truck?

If the tire has no exposed belting when discarded how long would it take the friction from hands and feet to expose the belting? If it happens within a reasonable length of time then it is fairly simple to unbolt the tire in question and to bolt a new one into place.

Even wood and metal wear with prolonged use and have to be eventually replaced. In some cases, if inferior materials have been used, they need to be replaced sooner than you would think. Maintenance is a standard priority for any environment thus using tires of any type does not pose any greater responsibility towards maintenance than any other material.

I have also found that one of its "problems" when put on landfills becomes an asset when used in children's environments - the fact that it has an extended life (does not readily or easily decay) will reduce maintenance - usually the connections corrode or wear first.

I have found that there are a large number of places in children's environments where it would be appropriate to use steel belted tires. Taking into consideration the obvious places where you would not want to take the chance of using steel belted radials - such items where a tire would need to be cut into (example: tire seat swings, water tables, sculptured animals, bumper guards on concrete tunnels etc, where the steel belting would become exposed in high use areas where there is a lot of movement by children over the same surface of the tire that might cause excessive wear over too short a period of time or in high stress places where the tire might tear or separate such as in Tire Nets) that still leaves a multitude of possibilities where this cheap, soft and versatile material can still be used.

Some of the most easily seen uses for the steel belted variety of tires are in the following:

- \* To create embankment walls to stabilize hills,

- \* To create enclosure edges to hold soft fill material,
- \* As “legs” for tables and low decks where part of the tire is buried under the ground.
- \* As hiding places (using huge tires),
- \* As terraced hills,
- \* As individual or terraced garden areas,
- \* As space filler under a top rail to create soft railing or as rails themselves,
- \* In tire bridges where the wear is along the side wall of the tire.

I have found in my own work using all types of tires that it isn't in what type of tires but how it is cut into and secured - the systems used to make the tire so it can be attached to the place where it is going to be used that is of highest priority. If the connecting system is too small or inadequate to handle the stress placed on it then it will rip out and leave an exposed and dangerous edge.

I would never use a badly worn or already torn steel belted radial but these types are only a small percentage of the tires available to communities and schools looking for a cheap, safe and readily available material to provide adequate and accessible play opportunities to all children.

There are many types of play behaviors that can and should be used to accommodate children's play in an outdoor play setting. The choice of material and activity areas is primarily limited only to one's imagination and resources. I have chosen tires based on the criteria of resources. Money is often a problem in many decisions concerning the development of outdoor play areas for children. I hope to share a number of ideas developed by others and myself throughout the world that will help interested parties to implement creative, interactive, safe and appropriate play environments for all children at a reasonable cost.

Through the simple use of old discarded tires I hope to show that a little initiative and imagination can go a long way to providing environments in a variety of settings and cultural venues for children.

There are a few items I must stress before getting to the actual designs themselves and must ask that the following criteria be heeded when not only planning the play areas but also during installation and construction.

## TIRES

The tires themselves should be carefully considered according to their placement and use. Tires that have patches or that have been bolted into place such that the bolts and protruding outside the tire need to be limited to items that will place those bolts away from movement patterns of children's use (i.e. if the tire is to be partially buried then the bolts can be placed the buried section of tire construction and items listed such as steps, stairs, supports, bottom row of the tire cubes, etc. are ideal for these types of tires if the bolts cannot be easily or cheaply removed).

In areas where steel belted tires are becoming readily available it is important to keep the following criteria in mind when selecting tires:

1. The steel belting should not be exposed around the complete circumference of the tire.
2. Badly "blown" tires where the steel belting is exposed in large sections (unless it is only one portion of the tire that could be buried as per the criteria for bolt patched tires above), should not be used.
3. Steel belted tires should not be chosen to use on pieces of equipment where the tire is to be cut into as it will leave jagged edges that will scratch and cut the children.

In choosing tires for other areas make sure that the tire will handle the stress placed upon it. Do not use extremely thin, worn tires in items such as tire nets, tire bridges, etc, where the attachment system is likely to tear through.

## ATTACHMENT SYSTEM

In bolting tires together it is important to keep in mind that the security and strength of the joint is only as good as the materials used and the care taken in putting them together.

There are three methods to join tires together and each depends on the tools and resources available to each community. I am going to explain each of them along with the tools needed (the alternative way of reaching these same goals) starting with the easiest and least time consuming to the one that requires the minimum number of special tools.

The first method I have used quite successfully is done with the following tools and hardware.

Tools: 1/2-inch drive electric impact wrench  
1/2-inch drive x 9/16-inch deep-set socket impact quality  
1/2-inch x 3-inch extension bar  
Power extension cords  
Electrical supply

Hardware: 3/8 inch x 3-inch hex head lag bolts  
(See tool and hardware page in appendix)  
3/8-inch x 3 inch round flat washer  
2 inch x 3 inch x 3 inch hardwood block with  
1/4-inch hole drilled in center.

The above materials are used when attaching tires to tires - whether 90 degree assembly (see drawings in appendix side-wall to side-wall, side wall to tread, or tread to tread).

When attaching tires to wood use all except the hardwood block (see drawing also in the appendix).

The impact wrench will drive the lag bolt straight through the rubber tires (even through the steel belting) so there is no need to pre-drill the tires using this system.

The hole drilled in the hardwood block allows the bolt to guide itself into the block without splitting the wood.

I have found it helpful to soak the blocks in used motor oil. This not only helps the bolt slip easily into the hole but also acts as a preservative to the wood so that it will last longer.

(In countries where the new mixed and extruded plastic and saw dust "woods" are available you will find them better for this method and they do not require soaking in oil to last a long time).

#### SAFETY NOTE

The person holding the wooden block on the point of the bolt after it comes through the tires should wear gloves as sometimes the block may spin with the action of the force of the impact wrench.

The second method uses the following tools and hardware:

Tools: Half-inch variable speed, reversible drill

Half-inch drill bit - this bit should have sharp teeth around the edge to cleanly cut the rubber tire.



- Power extension cords
- Power supply
- 9/16-inch socket
- 3/8-inch drive socket wrench
- 9/16-inch box wrench (spanner)

Hardware:

- 3/8 inch x 2 1/2 (or 3) inch threaded hex bolt
- 3/8-inch hex head nut
- 3/8-inch x 3 inch flat washer (2 per joint)

The third method uses the following tools and hardware:

Tools: Half-inch iron bar

- Heat source (fire, gas torch etc.)
- 3/8-inch drive socket wrench
- 9/16 sockets
- 3-inch extension bar
- 9/16-inch box or open wrench (spanner) or
- Two, 9/16-inch spanners (and no sachets or socket).

In the above last two methods the idea is to punch a hole either by drilling through the tire (using a drill bit a little larger than you actually need as the rubber tends to stretch outward as the hole is being drilled) or using a heated iron bar to burn/melt a hole through the tire.

If a fire is being used to heat the bars then it is best to have a number of iron bars so that a sufficiently hot one is available when needed. I found the availability of a gas torch to quickly heat the iron bars to be much more convenient.

When attaching tires to wood supports it is best to drill all the way through and use a longer bolt and counter sink (recess) the bolt heads below the surface of the wood (see diagram in appendix).

When attaching tires to metal supports it is best to use cup head carriage bolts with the rounded cup head on the outside of the metal pipe to cut down on protrusions that will snag and injure children. (See diagram in appendix).

If not cutting through a steel belted tire (the hot poker method will not work on steel belted tires) then an alternative method for cutting a hole on the tire is to use a very sharp knife and cut a square at the place

where the bolt will go. It is important to not over cut the hole as it will weaken the tire and may tear it when stressed where it has been over sliced.

Note: It will often make bolting easier if the large washers are hammered into a curved shape roughly corresponding to the curve shape of the tire before assembly.

After each tire construction has been completed and placed where it stays it is important to provide a hole as close to the lowest point of the tire as possible to allow water to drain from the tire.

Where non-steel belted tires have been used; it is fairly easy to cut a one-inch square hole with a sharp knife especially through the sidewall of the tire. If a steel belted tire has been used (and some tires have steel ribbing around the side walls, it will only be possible to cut a hole with either a larger hole drill bit or a jig saw with a rough wood cut blade (I have also found it easier to cut holes for drainage in steel belted tires before attaching them to the item to be constructed). After cutting the drain hole you can cover the ends of the exposed steel wires with silicon or in areas where it may not be available, I have found that the black rubber compound used to repair shoe soles works well. (It is used to fill in holes and to build up worn areas on shoes).

### SITE AND DESIGN CONSIDERATIONS

There are many criteria that a designer has to take into account when planning a children's garden. I am not going to go into them all but would like to list a few of the most important ones to keep in mind when planning a play environment.

#### SHADE/ SUN

Is there a balance of shade and sun available during different times of the day on different parts of the play environment? Are there trees that do provide shade of a type that will provide cool areas for active play in the hot summer months but drop their leaves and provide some warming sun into these areas in the cooler winter months? Children have the same needs as adults to be comfortable so either choose a site that has a balance of sun and shade or plan for long term use through wise and appropriate planting.

## DRAINAGE

Does the area drain well after a rainstorm? Are there going to be any additions that will need to be taken into account that might interfere with drainage? Retaining walls or landscape features that will hold back water and create unusable spaces? Is some water retention useful for children to splash around in after the rain? Are there ways to ensure that water does not stay in this place so long that it carries health risks? Sunlight and air are great purifiers - are these areas open to direct sun?

## SEATING

Are there places where older members of the community can sit close to the places where their children or grandchildren are playing? This aids not only in providing comfortable places to visit and talk but also provide ready access to a child in distress or trouble. Are there quiet places where children can gather away from the noisy active movement areas but still visually accessible to care givers and to the children so that they can see what is happening and decide to join? Can the seating be arranged not only for side-by-side sitting but also angled and face-to-face seating so that conversations and discussions are supported?

## ACTIVE AND QUIET SPACES

Not all children can or want to always be moving, climbing or swinging. Are there spaces that provide for more quiet activities such as dramatic play or digging in the sand? Are there equipment choices that fulfil the needs of both little children and big children? Are there a variety of choices so that children can spread themselves out instead of lining up and crowding individual pieces of equipment) so that tension conflict is reduced?

## SAFETY

There are a few primary rules of thumb to keep in mind when planning and installing play environments and equipment for children. There are many other safety considerations that a play environment designer needs to address when planning a play environment but the ones I am going to address now are the main ones that if not properly accounted for can cause the largest number and severest injuries to children. These areas pertain to the following criteria:

- Heights
- Surface
- Distance between equipment (fall zones)
- Entrapment
- Pinch and crush points.

The number one cause for all injuries (approximately 70% due to falls from either (1) heights, (2) on to hard surfaces or (3) on to other pieces of equipment. To safely reduce the likelihood of injuries happening from these three items the following criteria needs to be taken into consideration.

### HEIGHTS

Generally anything over 18 inches should have both a guard rail to keep children from slipping off or being jostled off and soft surface under and around where the child is likely to fall (more on surface materials in the next section). Generally it is not how high something is that gives a sense of adventure and challenge to children but what there is to do once you get there.

Very young children up to around 18 years old do not usually need to get higher than four feet off the ground (with three feet being maximum for children under 4 years old) and older children tend to need maximum heights to only about 6 or 7 feet off the ground. In the countries where standards have been developed the heights for playground equipment design are set at these maximum heights and, where taken into consideration with proper impact absorbing surface material, provide the widest margin for safe active play on equipment meant to have a high degree of movement.

### SURFACE MATERIALS

No matter what height the child is falling from if they fall onto items such as concrete or hard packed earth the likelihood of life threatening injury is possible from even low level fall heights of 9 to 16 inches maximum estimated distance 9 inches for bitumen and concrete with 16 inches for hard packed earth with force sufficient enough to kill a child falling on head). Thus it becomes imperative that due consideration be given to providing impact absorbing material under any area where there is a

potential for falling and especially to cushion areas where bitumen or concrete exist under climbing or swinging/moving equipment.

There are a variety of materials but the easiest to maintain and most readily available material is sand. A layer of sand placed under the equipment to a depth of 18 or more inches will generally reduce most injuries especially life threatening head injuries.

(It needs to be stated that even with an adequate layer of soft surface there is no way to eliminate all injuries as the child may fall in an awkward position that may break a bone. The point is to reduce the likelihood of serious injury and reduce the number of overall injuries.)

There are other materials besides sand and they include both natural materials such as pea gravel, mulch, sawdust, and man made materials such as shredded tires, rubber matting, etc. The choice is of course yours but sand has the benefits mentioned above as well as the added one of being a play material something that can be manipulated, sifted, shaped (when wet has weight, volume, mass, is warm in the sun and cool in the shade and which can be whatever the child wants in pretend play situations. See the appendix for specifications on sand.

If the type of sand specified in the appendix is not available then more maintenance is required to keep air in between the grains, as it is the air that reduces the possibilities of injury. Turning the sand from time to time may be necessary.

### OTHER PIECES OF EQUIPMENT

Falling off one item onto either another play item or the edge around the equipment another major form of injury to children. The general rule is that anything the child can fall from (no matter what height) should not be within six feet of any other item. If there is six feet of fall zone space from either other pieces of equipment and from edges that encloses the equipment you will greatly reduce injuries to active moving children.

### ENTRAPMENT

For this the main thing you want to remember is you either want the child's body and head not to be able to pass into or through the opening or to pass easily through without getting stuck.

Generally as long as there are no openings that are between 3.50 inches and 11 inches - that is that the opening is either less than 3.50 inches or

larger than 11 inches then the likelihood of any child becoming entrapped by either their head (and thus hanging by the neck and strangling) or by their body will be greatly reduced.

The other entrapment criteria to watch for are angled openings that cone down to a "V" without leaving a sufficiently open angle to not pinch or entrap the child if stepping or slipping into the opening.

### PINCH AND CRUSH POINTS

These include any moving parts that are likely to crush or amputate any part of the child examples are old type see sans, chain links on swings that allow young fingers to enter between the links, many types of roundabouts (merry-go-rounds) that have too great a ground clearance that allow arms, legs or heads to slip under while moving thus crushing by wedging under.

The last item I would like to discuss concerning safety is the need for a reliable and continuous maintenance schedule. There is no way to build anything that is intended for children's use (and the greater the attraction the greater the use) that is not going to need maintenance attention from time to time. Sand or soft fall material needs to be cleaned, sifted and replenished moving parts need to be checked for wear and greased or oiled as needed - high traffic areas will need to be watched for wear - even trees and landscaping will need to be trimmed, culled and given care. If some criteria for maintenance is not planned and provided for then it is probably wise to do no play environment at all. By providing an outdoor play provision area in your child's school or community the message you intend to give to the child is one of respecting of who and what the child is. If the child sees that their space is allowed to fall into disrepair and neglect then that is the direct message the child will receive. A message of "the space I use is not kept up so that I can fully use it" - thus who the child is and what the child likes to do in not respected. Why should any child show respect to the space / area / community if respect isn't shown then. This also goes into the realm of purposely-vandalized equipment - the children using the space need to see that an effort is made to keep the space usable and functional no matter what the reason is for its damage. The message needs to be a continuous one of respect so that the users see and feel it thus they return it. After all damage due to vandalism is usually due to the actions of only a few why should everyone have to suffer for the lack of respect of only a few?

## LINKING AND EQUIPMENT

Observations by professionals who have spent much time watching how children play and use climbing equipment in play environments have clearly shown that children extend the amount of time they spend on using various pieces of equipment and show an increase in the complexity and variety of behaviors (not only as individuals but also as a social/group participant) when equipment choices are linked together into connected wholes. Individual pieces of stand alone climbing equipment tend to discourage spontaneous continuous play behaviors it should be pointed out to the person who will say that they see children using the isolated monkey bars etc. all the time in neighborhood parks is that, yes, children will use whatever is available in their environment. What I am talking about is a more natural and positive flow to the play behaviors of children engaged in moving through an environment). Waving pieces of climbing equipment linked together so that there is a wider range of choices climbing, balancing, moving options - within the child's immediate environment that are joined together in ways that enhance and encourage a wide range of skills.

This is done through linking equipment so that the children move across or onto one item they move to or towards another choice. When they reach an area such as a deck or "platform" of some type there are a number of choices to move on to. These choices have a varying range of skill levels so that the child can be successful on their own according to their skill, competence and confidence. Each "platform" (if a square) offers four directions the child can choose to go some of them leading to other "platform's" or "linking stations" where there are other choices and some of them coming to "dead ends" (such as slides, slide poles, enclosures, edges etc.) The more links and choices that exist in the environment for the children then the greater the range of behaviors and the more appropriate the decisions children will make in the use of the equipment.

## VARIETY

Variety within a planned play space for children needs to take into consideration the needs of a wide range of ages of children thus a wide range of abilities, competence and confidence) and needs also to

consider the idea that not all children can or want to only climb or move in an outdoor play space.

Variety needs to encompass as many of the possible play behaviors not only of individual children but also large and small groups of children.

To include play choices that encompass play behaviors that range from active to quiet; solitary to group; young to old; physical; emotional; social; manipulation of the environment etc. within a wide range of areas and spaces is the key to providing an active, dynamic play space for the community (of children as well as adults).

To provide such areas as:

- A variety of swings
- Individual as well as groups,
- Seat and/or tire type,
- Upper-body swings such as trapeze-bars,
- Social type such as a hammock or porch swing.
- Sand and water play areas that allow for manipulation with:
- Dramatic play areas such as cubbies and table top surface areas;
- Logs and boulders to provide natural boundaries and space for individual or small groups to play together without being disturbed by other children.

Variety of seating;

- Quiet places for talking, thinking or reflecting either alone or with a friend:

- Natural areas - to provide opportunities to interact with nature and to provide for aesthetic qualities:

-Open spaces for:

- Group games
- Sports
- Chase games

Table space for:

- Eating
- Writing or doing homework;
- Table games;
- Or small groups to sit talk and share.



- Trees and flowers that are in the environment to be touched and explored and grass for walking, touching and lying on.

A community play space whether in the larger community of a neighborhood or the smaller community of a school or a child care facility - needs to be a space that provides a wide variety of choices so that all in the community can find enjoyment and pleasure in the shared space.

The rest of this book will be committed to the design criteria of specific pieces of playground equipment using primarily tires. There are by necessity other materials to be used with many of the designs but these are kept to a minimum. I have also included a few other items that can be easily constructed using readily available materials that can extend and enhance the design of your proposed environment. I hope this guide is of help to you and good luck in your endeavors for and with children.

I have provided ideas and design criteria for the following play activities:

1. Climbing
2. Swings (see appendix for dimensions)
3. Sand and water play
4. Dramatic play
5. Landscaping, retaining walls etc.
6. Fantasy
7. Loose or movable constructive
8. Quiet
9. Movement equipment
10. Group
11. Solitary

## Tire Ladder Basic

### Materials

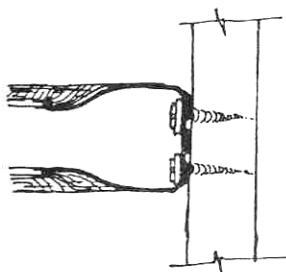
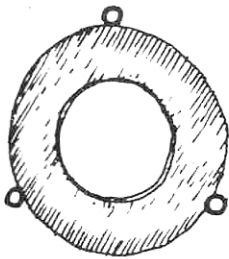
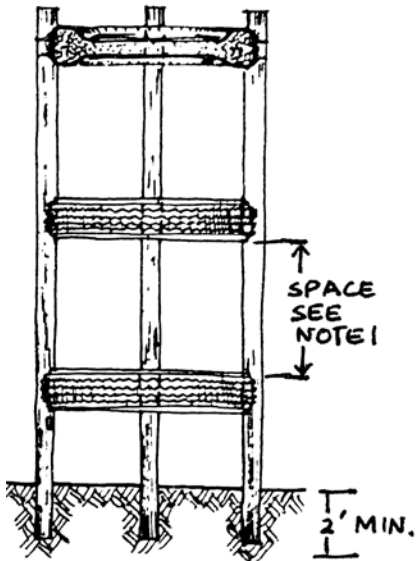
For three-tire construction  
3 – 5" diameter x 12' Posts  
3 – Tires  
18 – 3/8" x 3" Lag Bolts  
18 – 3/8" x 3" large flat Washers

### Tools

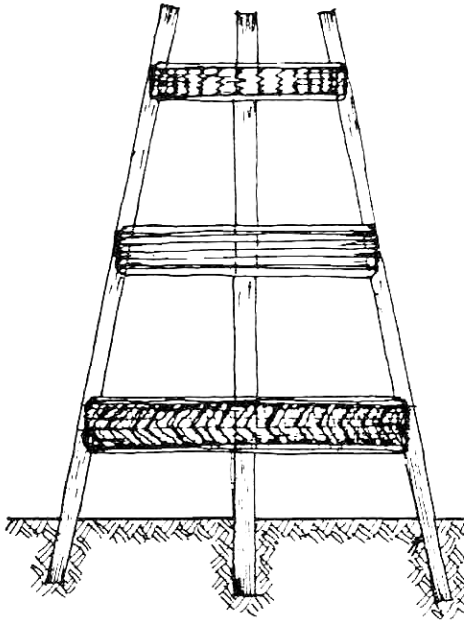
Digging Bar, Brace + 5/6" Bit  
Socket wrench set  
Sharp Knife

### Notes

1. Space between tires needs to be greater than 11" but should not exceed 18".
2. Cut drain holes in each tire at the lowest point. It helps to tilt tires slightly for ease of drainage.
3. More than 3 tires can be used to construct this item but height of upper tire should not exceed 4½'.



**Two Bolts + Two large washers  
at each point where tire touches post.**

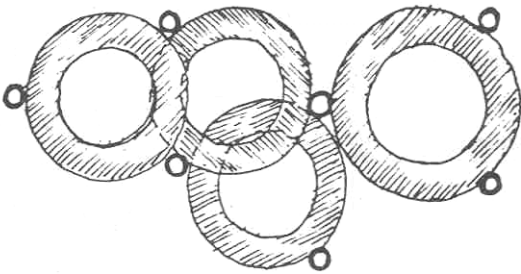
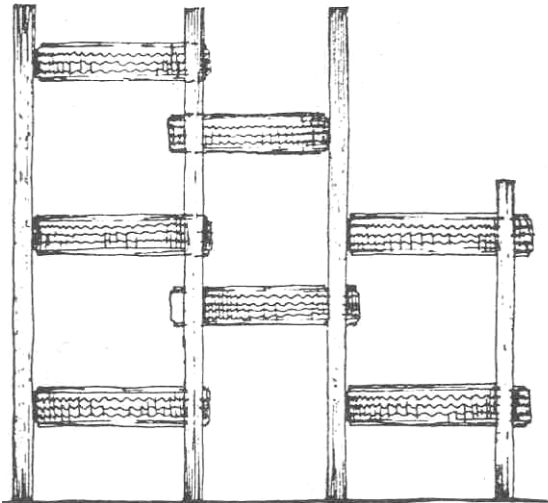


## **Climbing Tire Ladder Variation**

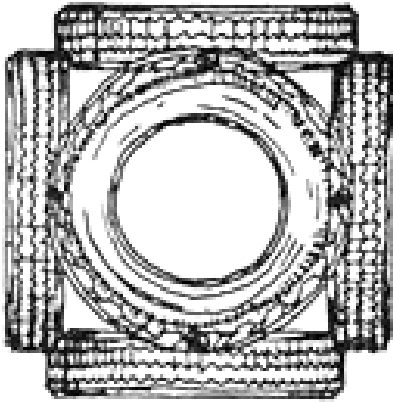
**Materials**  
Same as basic.  
Adjust to variation.

**Tools**  
See Basic

**Use three or four Tires in graduated sizes to create this effect.**



**Use varying sizes of tyres  
set at varying heights  
to add variety  
and a number of 'Platform' areas.**



Movable loose material  
**Tire Cube-Basic-Loose**

**Materials**

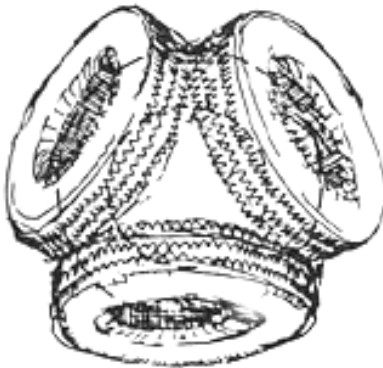
- 6 similar sized Tires
- 12 – 3/8" x 2" standard Bolts
- 12 - 3/8" hex head Nuts
- 24 - 3/8" x 3" large Washers

**Tools**

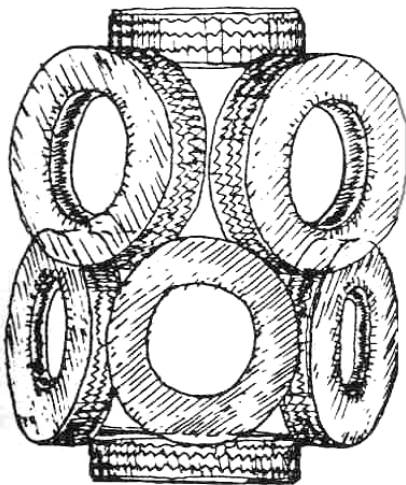
- Drill + 1/2" Bit or Hot Iron Bar
- Ratchet + Socket set
- 9/16" Box/Open Wrench

**Notes**

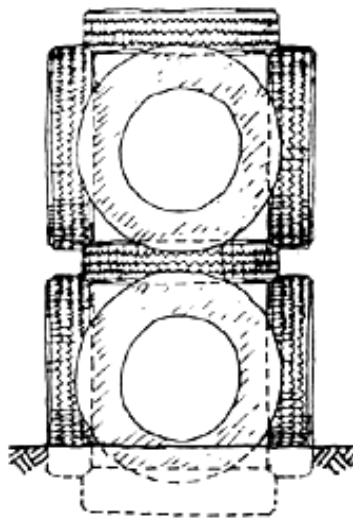
1. Tires connected using tyre-to-tyre 90-degree bolt connection.
2. Drain holes in sidewalls (inside of cube) in each tire.
3. Single cube item is loose and free to move around.
4. Any size tires can be used but the larger the tire the heavier the cube.
5. Can be made stable by filling bottom tire and part of side tires with earth/sand.



**Triangular Pyramid**



**Dome 12 Tires**

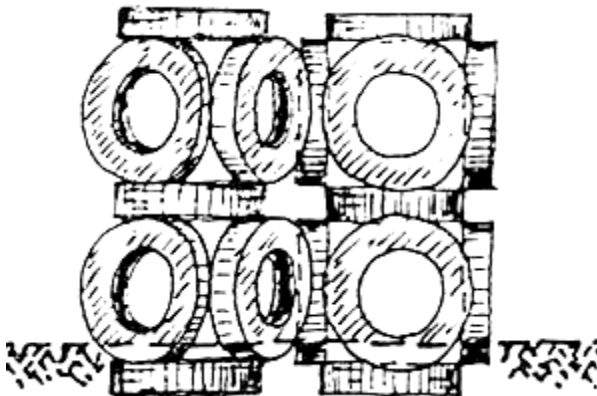


Large Truck Tires

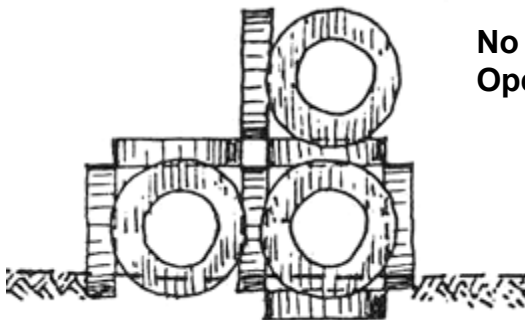
Drain Holes

Ground Filled

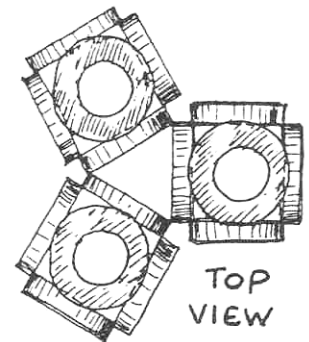
Leave some tires out to create a maze effect.



Side view



No Top Opening



TOP VIEW

Tires at back of cube but not in the front.

Climbing  
**Tire Cube-Climbing Variation**

**Materials**

Same as Basic with adjustment to configuration changes.

**Tools**

Same as Basic Tire Cube.

Assemble Basic Cube in various combinations.

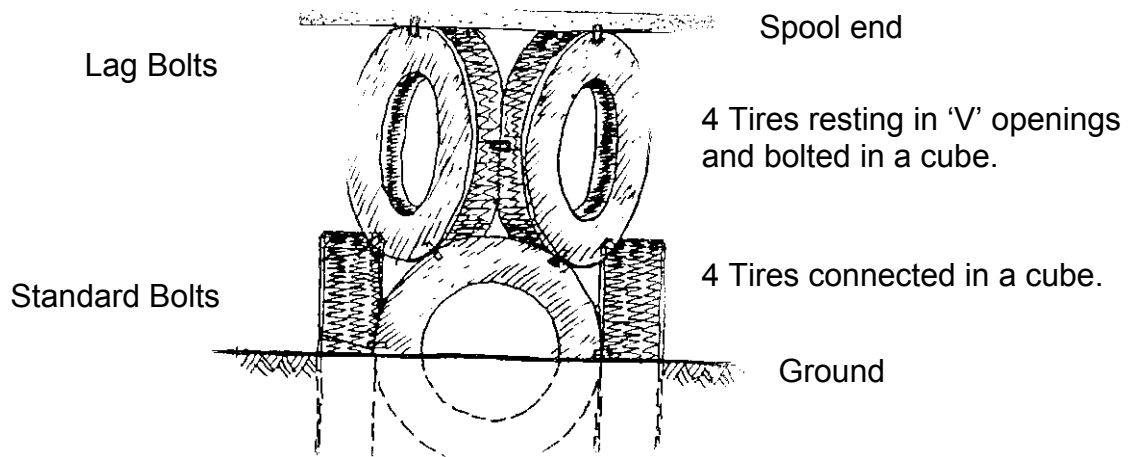
## Climbing Tire Platform Support

### Materials

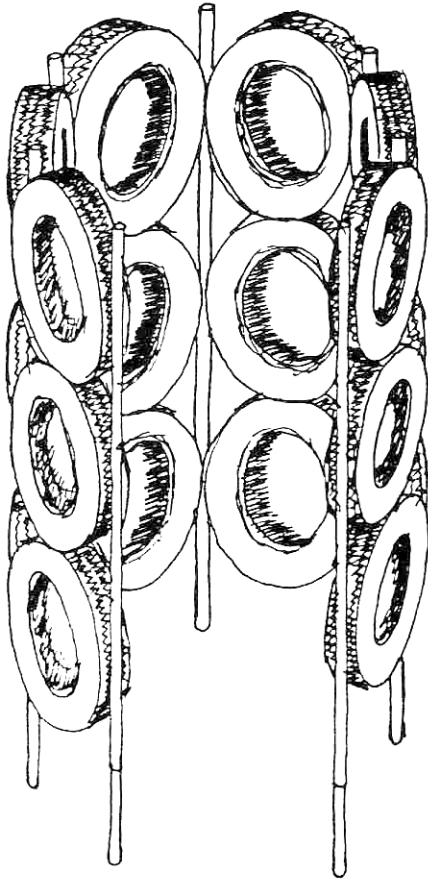
- 1 - Large wooden Cable Spool End
- 8 - Truck Tires
- 16 - 3/8" x 3" standard Bolts
- 16 - 3/8" hex head Nuts
- 3 - 3/8" x 3" lag Bolts
- 35 - 3/8" Washers

### Tools

Same as Cube and Ladder



Climbing  
**Tire Circle**



**Material**

- 18 – Auto Tires
- 72 - 3/8" x 3" lag Bolts
- 12 - 3/8" x 2 1/2" standard Bolts
- 12 - 3/8" hex head Nuts
- 96 3/8" x 3" flat Washers
- 6 – 5" x 10' Posts

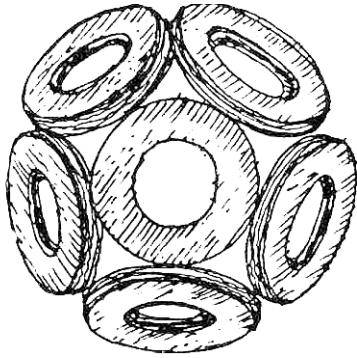
These materials are required for the design shown in this illustration.

**Tools**

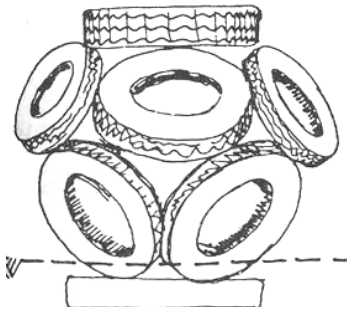
Same as tire Ladder and tire Cube.

**Note**

The materials required would vary depending on the size of the circle that you want. The above listed materials are for the design shown in the drawing.



Top View



Side View

## Climbing Tire Dome

### Materials

- 14 similar sized Tires
- 36 - 3/8" x 3" standard hex head Bolts
- 72 - 3/8" x 3" flat Washers
- 36 - 3/8" Nuts

### Tools

- Drill + 7/16" Bit or Hot Iron Rod
- Ratchet + Socket set, 9/16" wrench,
- Level

### Notes

1. Dig hole where anchor tires will go and fill each lower tire after bolting tire above.
2. Tires are bolted at each place where they touch.
3. Drain hole in each tire above ground at the lowest point.





Top View



Side View

## Climbing Tire Pyramid

### Materials

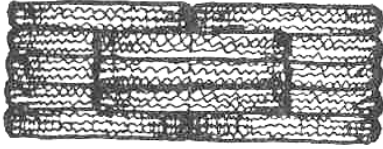
- 25 large truck Tires
- 54 - 3/8" x 3" hex head standard Bolts
- 54 - 3/8" Nuts
- 108 - 3/8" x 3" large flat Washers

### Tools

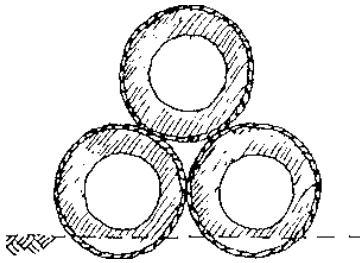
Same as Dome

### Notes

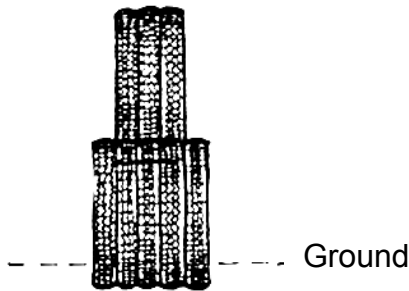
1. This construction is made by first constructing four triangles of four tires each – three for the base and one each for the peak.
2. Attaching the base together with the middle tire.
3. Attaching second row of tires in cradles.
4. Placing top triangle at peak and bolting together.



Top View



Side View



Front View

## Climbing Tire Tunnel

### Materials

- 13 large truck Tires
- 11 - 3/8" x 2" standard Bolts
- 30 - 3/8" x 3" standard Bolts
- 41 - 3/8" hex-head Nuts
- 82 - 3/8" x 3" Washers

### Tools

- Electric Drill + 3/16" Bit or Hot Iron Bar
- 2 ratchet wrenches
- 2 - 9/16" box wrenches
- 2 - 9/16" deep sockets

### Notes

1. The short bolts are used to attach the sidewalls together (3 x)
2. The longer bolts are used to attach where tread touches tread in side view drawing.

Climbing  
**Tire Maze**

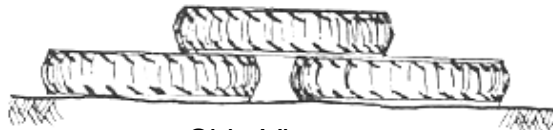
**Materials**

4 huge Tires (the bigger the better!)

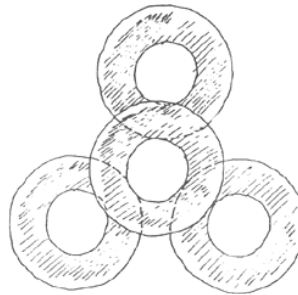
The really large ones that need a crane to lift them into place.  
Have position planned and marked out.  
So that the tires can be set in place where delivered.

**Tools**

Hot Iron Bar (to cut drain holes)



Side View



Top View

Space large enough  
to crawl through

**Note**

If possible cut some additional access holes (child size)  
into treads and side walls to give in/out places through maze.

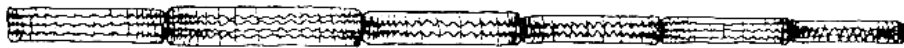
Climbing Landscape  
**Tire Steps**

**Materials**

Tires – any/all sizes

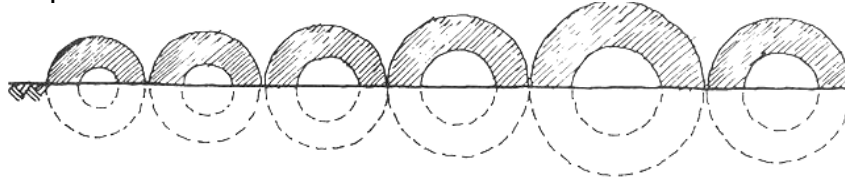
**Tools**

Shovel



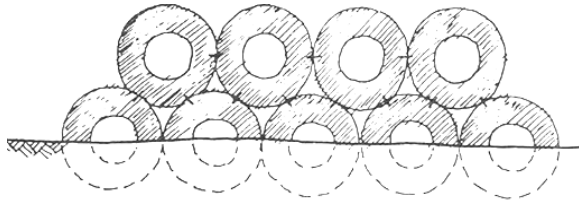
1

Side view

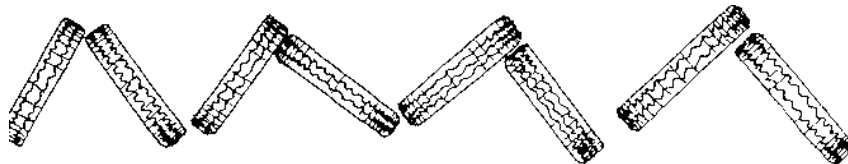


The single configuration shown above  
will also make effective fences and dividers for areas.  
Double configuration is shown below.

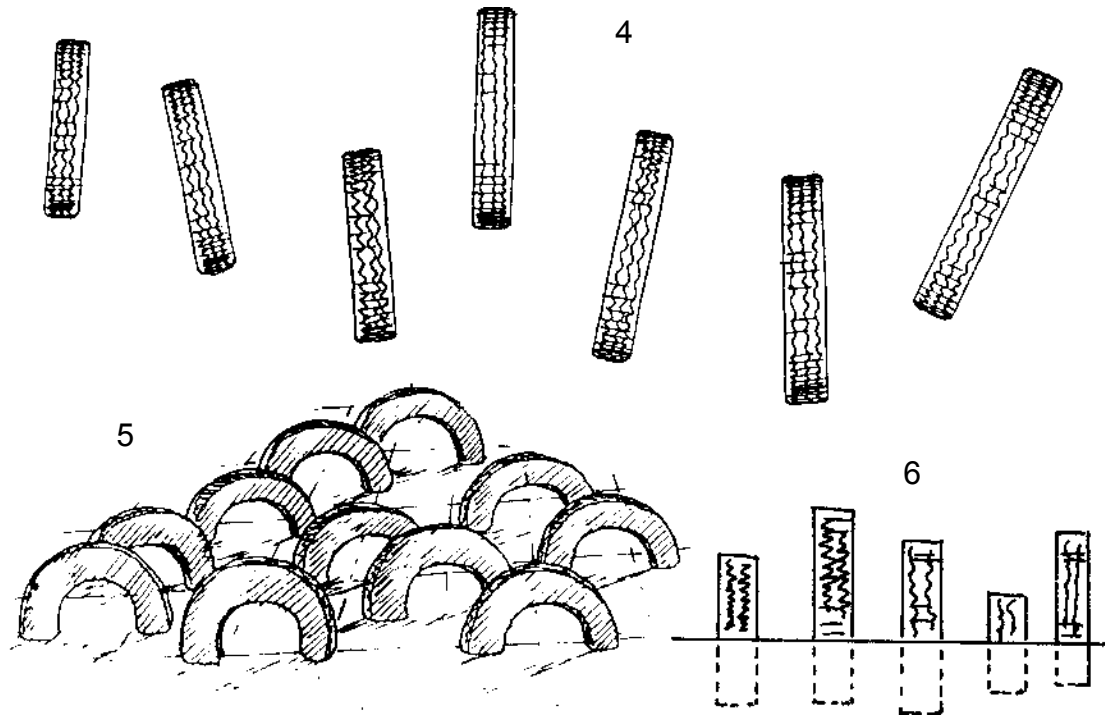
2



3

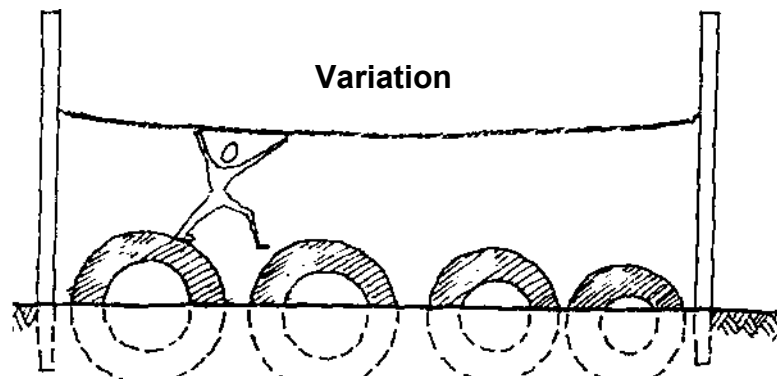


## Tire Steps Continued



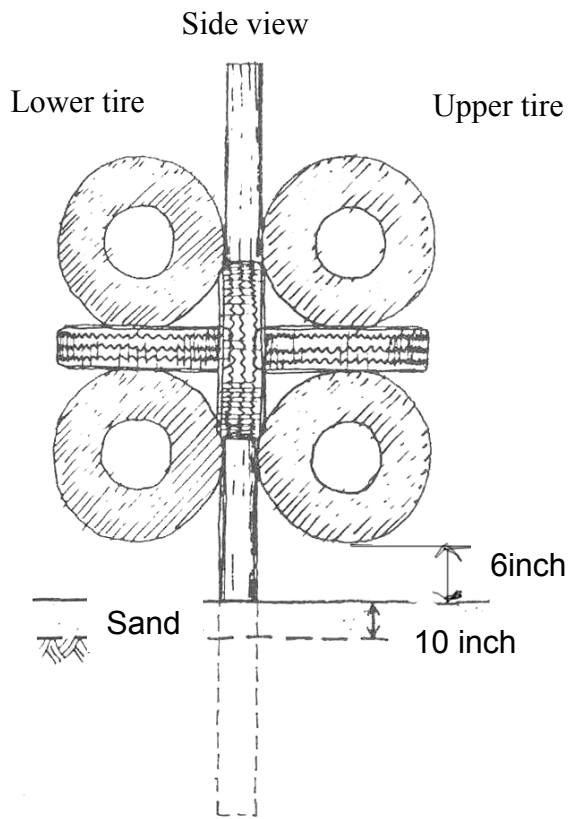
### Notes

Combine in any combination of the above with variety of spacing to encourage jumping and leaping and bury tires at varying heights as shown in picture number 6.



### Note

Add rope above with wider spacing between tires to 'swing' across.



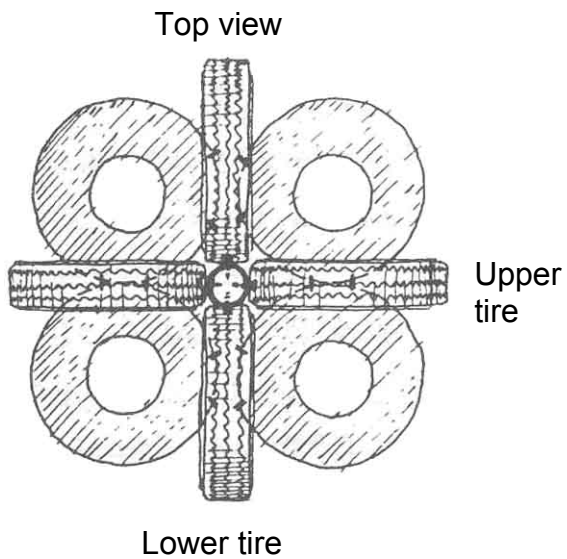
## Climbing Tire Tree

### Materials

- 12 – Auto Tires
- 1 – 5" diameter x 12' Post
- 20 - 3/8" x 3" lag Bolts
- 12 - 3/8" x 2 1/2" standard Bolts
- 12 - 3/8" hex-head Nuts
- 44 - 3/8" x 3" flat Washers

### Tools

Same as used in construction of  
Tire Ladder and Tire Cube



### Notes

Each tire needs to be bolted at three points  
of contact to keep tires from spinning.

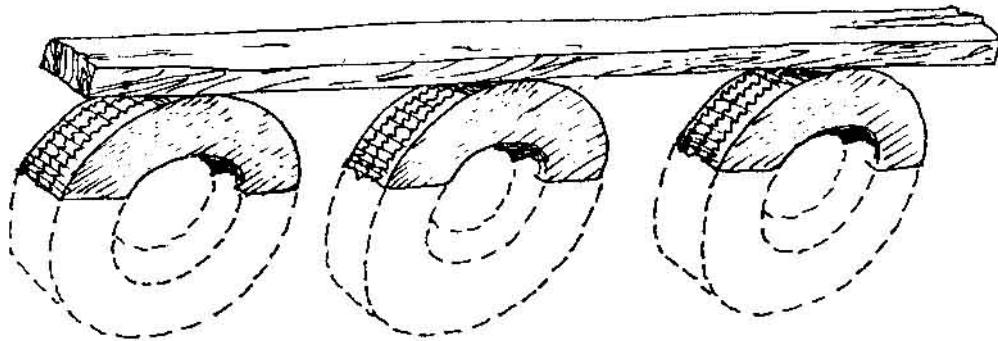
Climbing  
**Balance Beam or Bench**

**Materials**

- 1 wooden beam (any length)
- 3 - 4 Auto Tires
- 6-8, 3/8" x 3" lag Bolts
- 6-8, 3/8" x 3" flat Washers

**Tools**

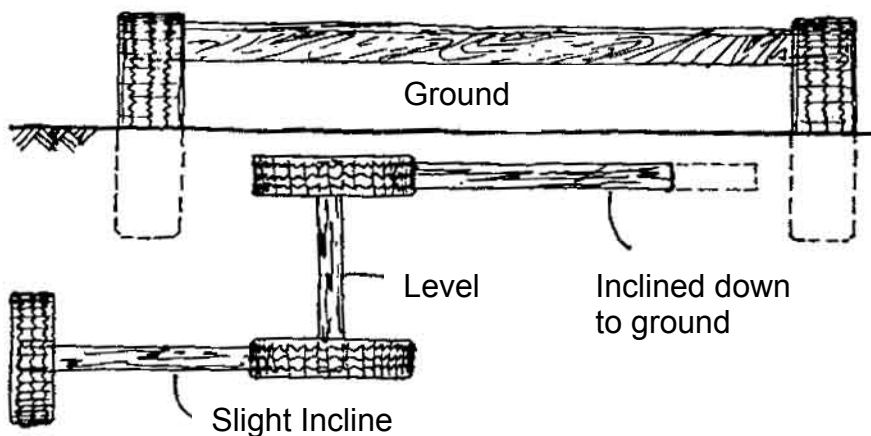
Same as for Tire Ladder plus a shovel



**Notes**

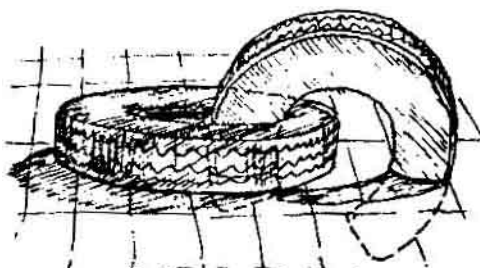
1. Two bolts at each point of contact of tire to wood.
2. Tires buried at least half into ground.
3. Any size tires can be used.
4. Can be made level or at any angle.

Variation (1 wood beam + 2 large truck tires)



**Notes**

1. Cut holes in side-wall of tire to fit diameter of log/post.
2. Can also cut through tread.



## Climbing Tire Climb

### Materials

2 large truck or tractor tires

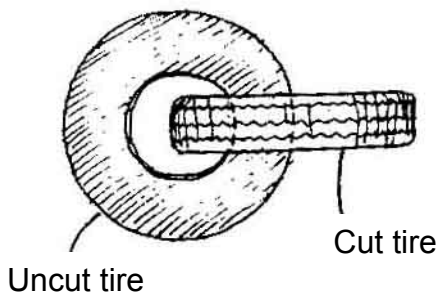
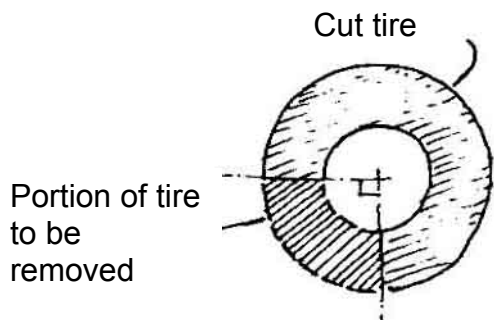
### Tools

Shovel, hacksaw, and digging bar, sharp knife.

The shape and size of the tires will determine whether the fit will be loose or snug.

### Notes

1. Cut approx.  $\frac{1}{4}$ " of one tire segment  
—  
use hacksaw to cut cable bead on inside or rim – use knife to cut tire.
2. Dig trench approx. 45 cm deep and 1 meter long.
3. Place uncut tire over trench as per drawing.
4. Place uncut tire through hole and in trench.
5. Fill with soil.





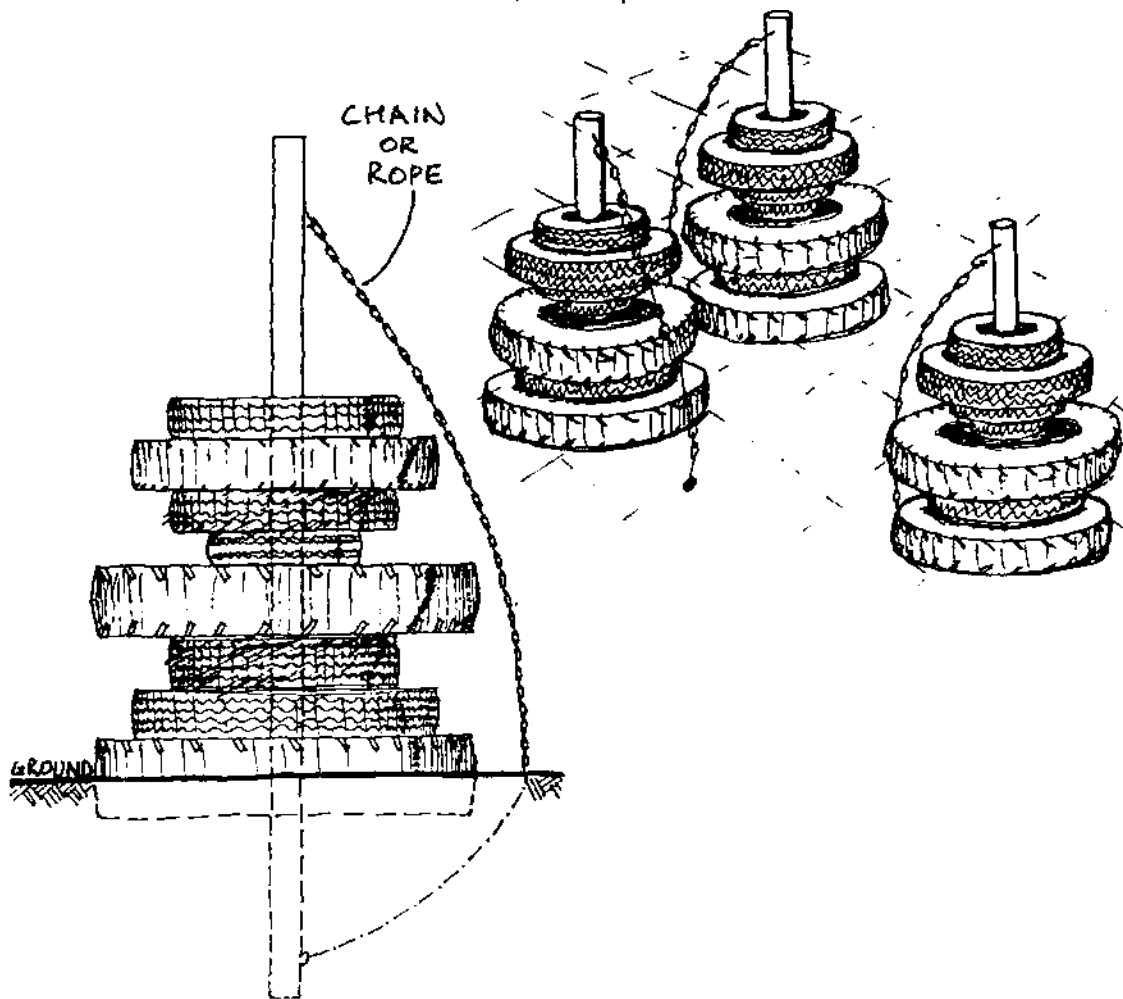
Climbing  
**Tire 'Mountain Climber'**

**Materials**

3 – 5" diameter Pole x 12'  
6 – 3/8" x 3" lag Bolts  
25' long, 1/4" proof Coil-Chain  
25 – various size large Tires

**Tools**

Shovel, 9/16" spanner



**Notes**

1. Attach chain or rope to base before burying.
2. Place structures jumping distance away from each other.
3. Tires should be filled with sand but it is not absolutely necessary. Looseness adds to adventure.

## Climbing / Dramatic Tire Stairs/Cave

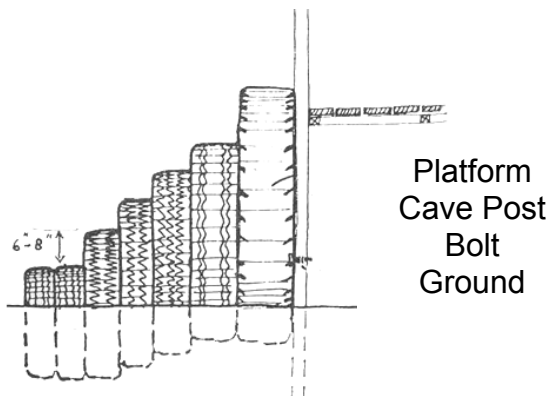
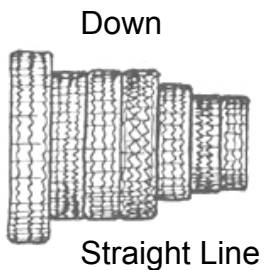
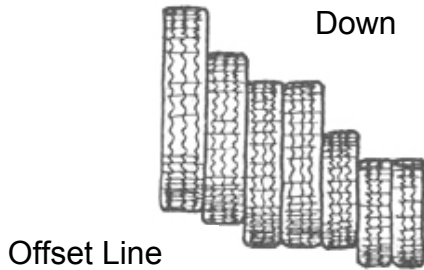
Type 1

### Materials

- 2 – Tractor Tires
- 4 or 5 Truck Tires
- 2 or 3 large Auto Tires
- 4 – 3/8" x 3" lag Bolts
- 4 – 3/8" x 3" Washers

### Tools

Same as Tire Ladder



### Notes

1. Bolts are needed only if attaching to deck.
2. May lead up to anything – acts just like stairs.
3. Rail may be added down one side.
4. Paint inside white to make it more inviting for small children.

## Tire Stairs/Cave

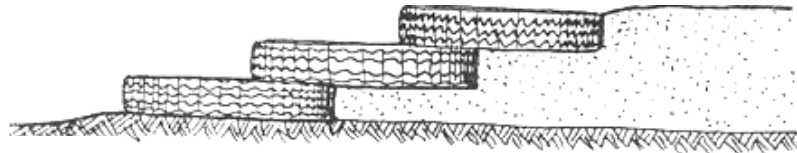
### **Type 2**

#### Materials

- 15 – Auto Tires
- 20 – 3/8" x 3" standard Bolts
- 40 – 3/8" x 3" Washers

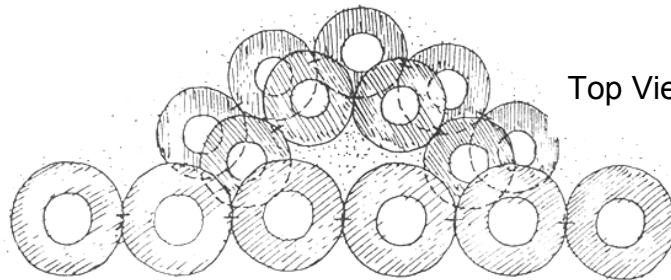
#### Tools

Same as Tire Cube



Sand or Earth

Side View



Top View

#### Note

Materials change according to number and width of area covered by 'stairs'.  
They can be placed in any configuration  
and can vary in size according to the step pattern.



Single Line  
Uphill Side

Climbing  
**Tire “Jumble” Maze**

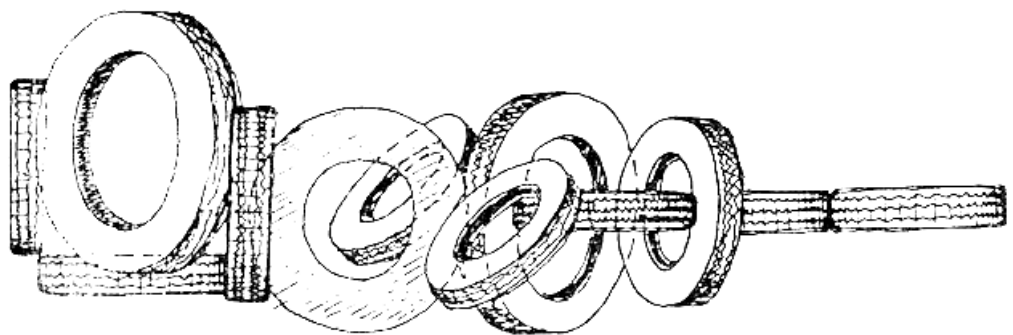
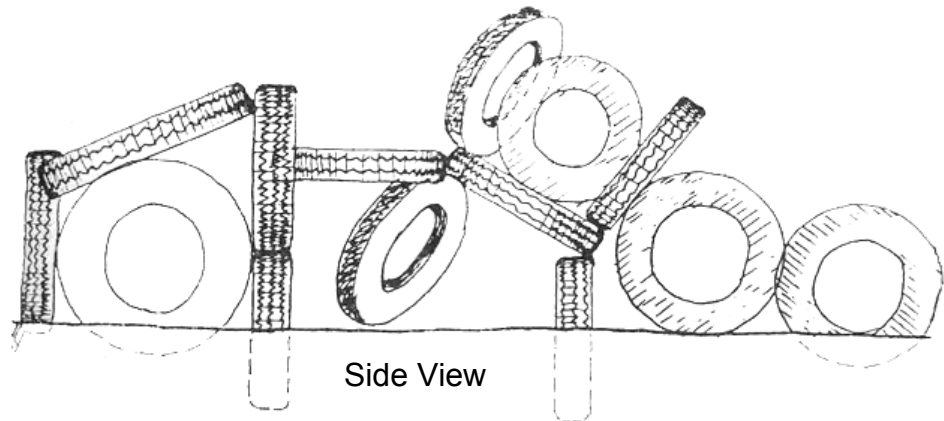
**Materials**

1. Will depend upon the final configuration of “Jumble” of tires to create climbing net areas.  
The same bolting arrangement can be used as in the Tire Cube. It is actually a combination of Tire Stairs (Type 1), Tire Cube, and Tire Steps etc. to create a maze like structure.
2. Use all sizes of tires to add variation and visual texture.
3. Make 2 or 3 “Layers” or “Stories” deep in height.

**Tools**

Same as Tire Cube and Ladder.

Top View



Top View

Climbing  
**Tire Bridge**

**Materials**

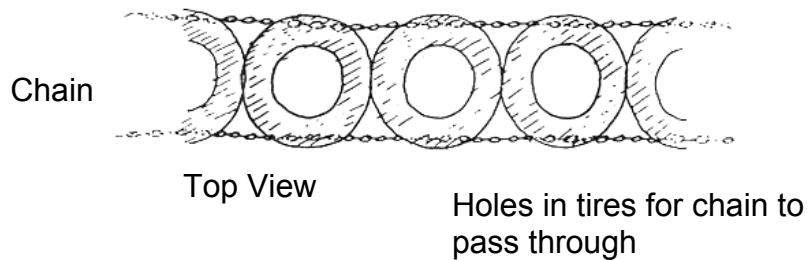
4-6 Non-steel belted off-road Tires.  
The number depends on the length of spacebridge.  
30' (approx.) 1/4" proof coil-chain, zinc plated is best to reduce rusting.  
1/4" lap link.

**Tools**

Shovel electric drill and bit large enough to drill hole  
so that the chain can pass through pliers.

**Note**

Cable can be used but should be flexible type – multi-stranded, fibre coir.  
Rope can also be used but will need more replacing as it wears.

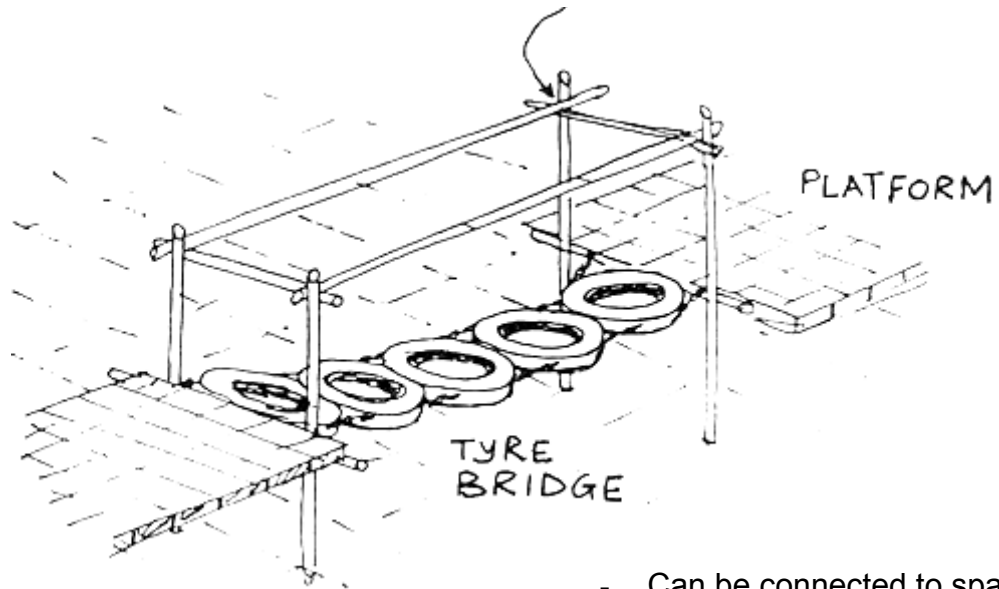


**Notes**

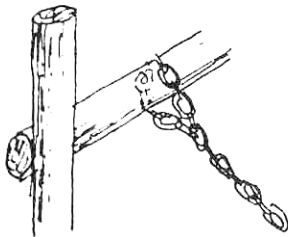
Lay tires on temporary support structure between the entrance/exit points.  
Tires should fit snug (tightly) between support cross bars.

## Tire Bridge continued

Brace at top of poles bolted or welded,  
to keep weight from pulling in Platform



- Can be connected to span between any two structures.
- Metal or wooden decks
- Tire ladder
- Tire cubes
- Tire circles
- Hill and any of above.



Wrap chain around stout bolted or welded cross bar that will support weight of tires and children.

Connect with lap link.

Please ensure that proper braces are installed.

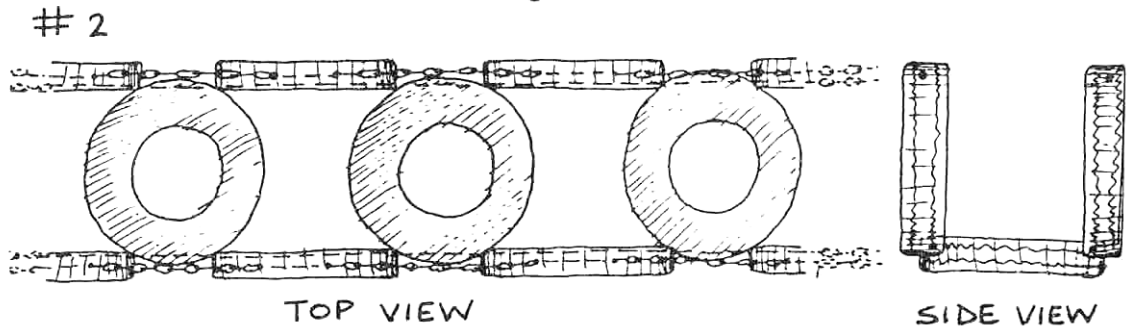
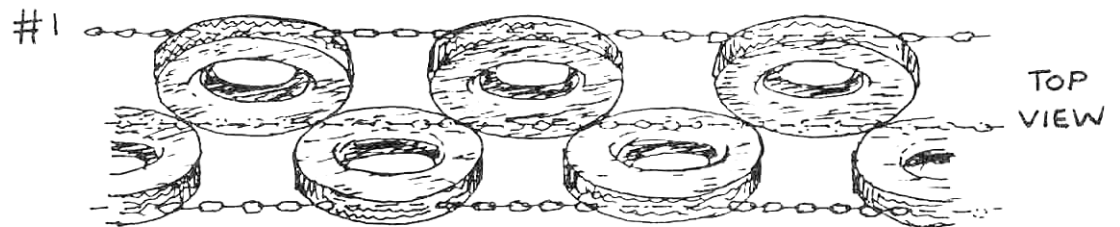
Climbing  
**Tire Bridge Variations**

**Materials**

Basically same but adjust numbers according to size and type.

**Tools**

Same as Basic Tire Bridge



3. Slightly incline the support bars in opposite directions so a twist happens in the bridge.

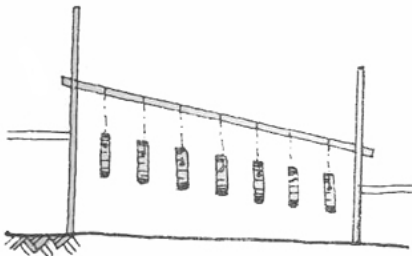
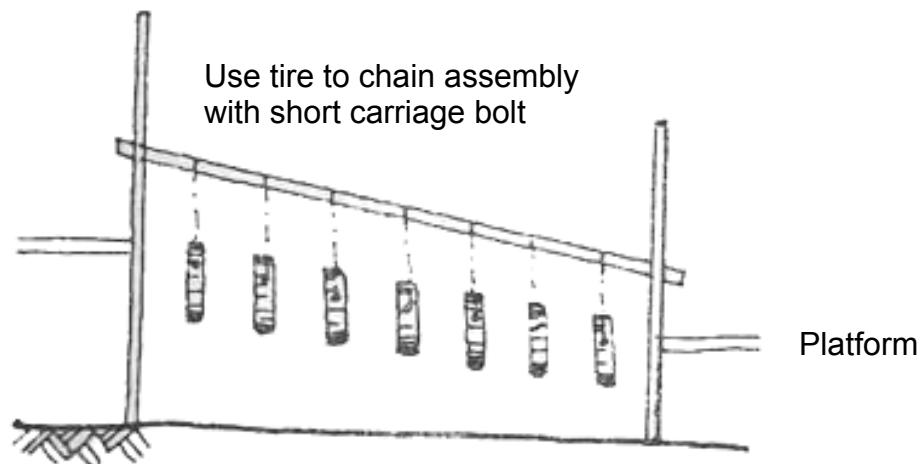
Climbing  
**Vertical Tire Bridge**

**Materials**

- 2 – 12' support Beams
- 10 – Auto Tires
- 20 – 3/8" x 2½" carriage Bolts
- 20 - 3/8" x 6" carriage Bolts
- 40 - 3/8" Nuts
- 20 - 3/8" standard Washers
- 40 - 3/8" x 3" Washers
- 40', ¼" proof Coil-Chain

**Tools**

Same as Cube and Ladder

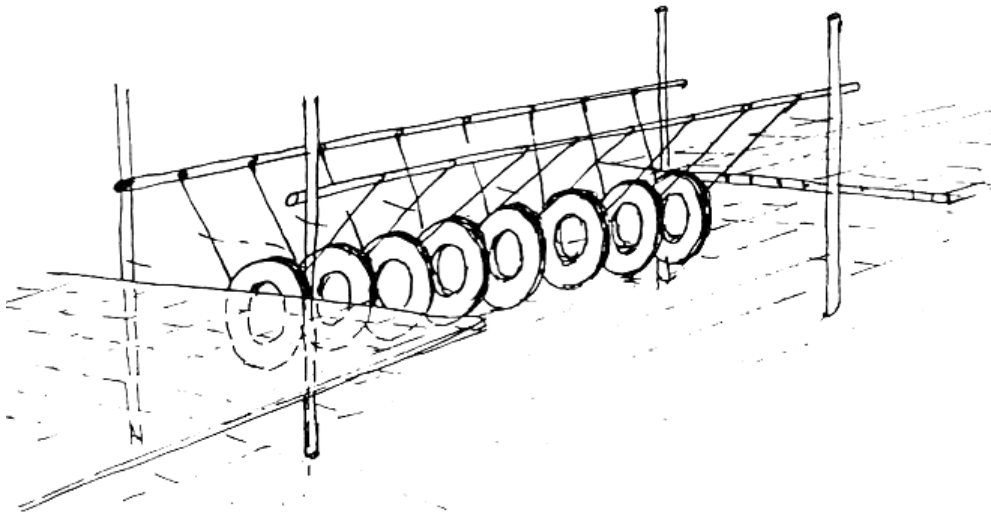
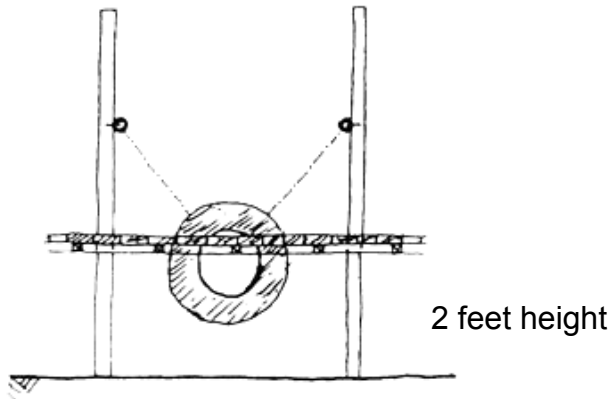


**Note**

Can be built as shown  
or at an incline from low deck to high deck.



## Vertical Tire Bridge (Continued)



### Chain to Post Detail

Nut  
Washer  
Countersink hole  
Carriage bolt  
Chain

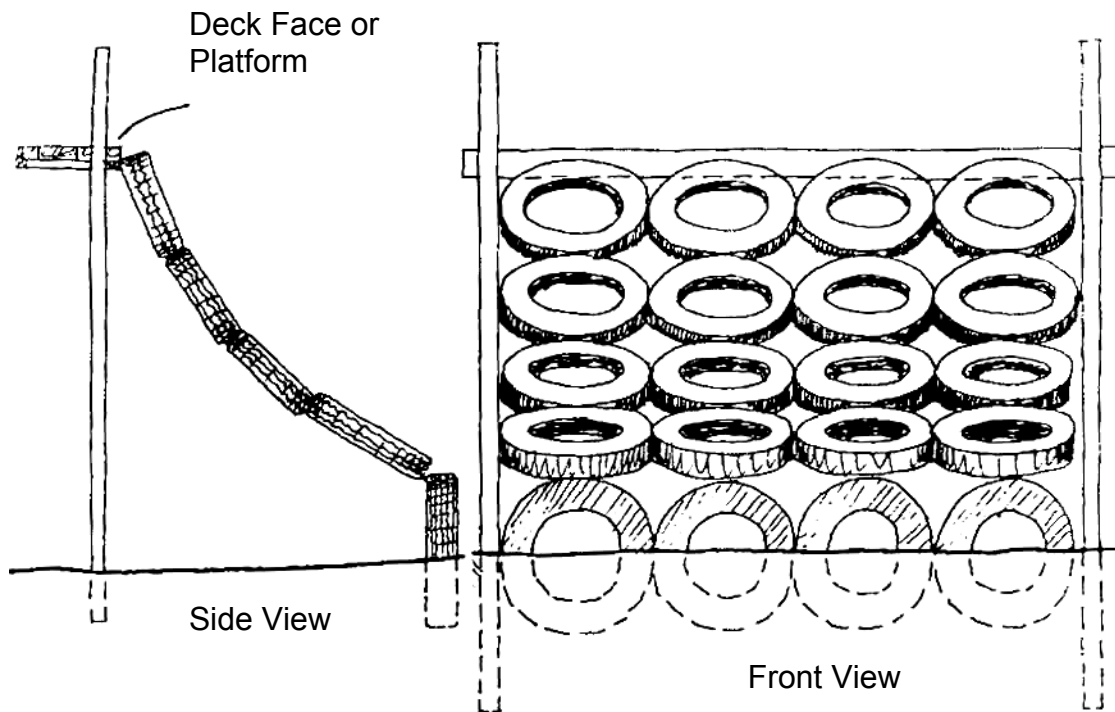
## Climbing Tire Net

### Materials

- 25 – Auto Tires
- 31- 3/8" x 2 1/2" Standard Bolts
- 35 – 3/8" Nuts
- 66-3/8" x 3" Washers
- 4 – 3/8" x 3" Standard Bolts
- 4 – 3/8" Standard Washers

### Tools

Same as Tire Cube and Tire Ladder



### Notes

1. Use 3" bolts to connect top tire to deck all the way through beam.
2. Pull Tires tight during assembly.
3. May also be connected to tire "Decks" like cube or pyramid
4. Can be made smaller or larger depending on space or materials.
5. Can also be placed to fill in space between two "Deck" to create large bridge or "Net" Climbing.

Climbing  
**Tire/Chain Ladder**

**Materials**

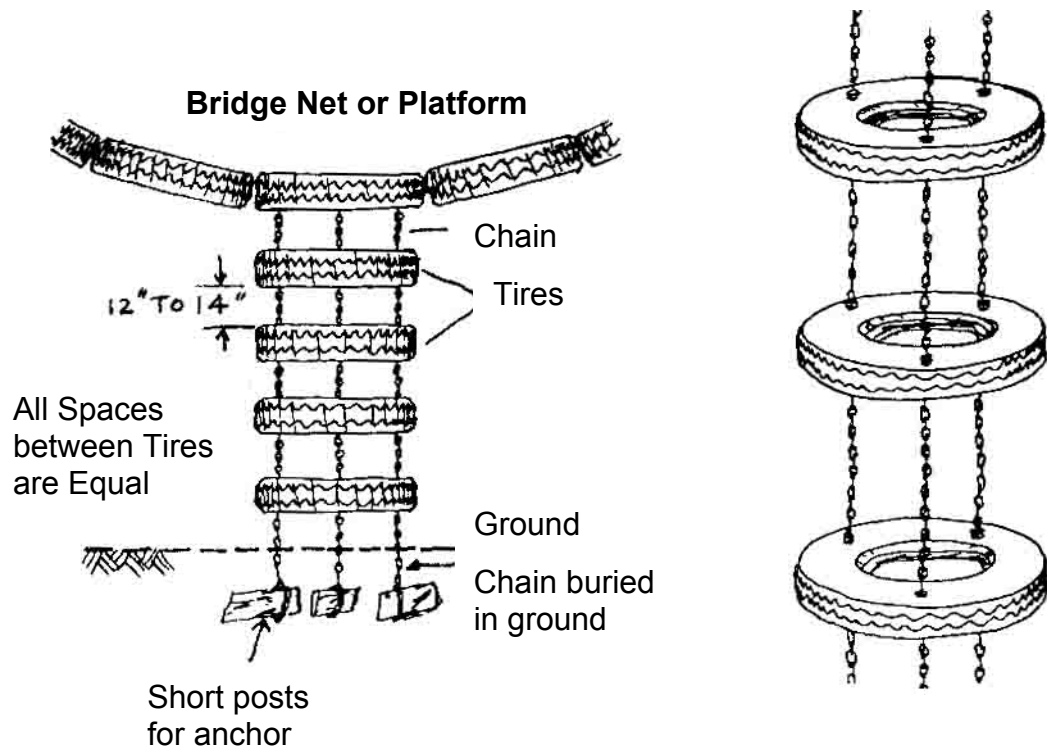
- 4- Large Auto Tires
- 27- 3/8" x 2" Carriage Bolts
- 27 - 3/8" Nuts
- 27- 3/8" Standard Washers
- 27- 3/8" x 3" Washers
- 10 - 1/4" Proof Coil Chain
- 3 - Short logs

**Tools**

Same as tire cubes Hack saw or Bolt cutters to cut chain.

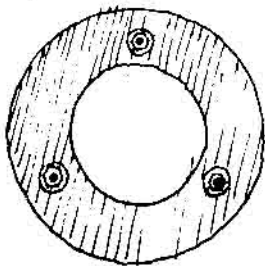
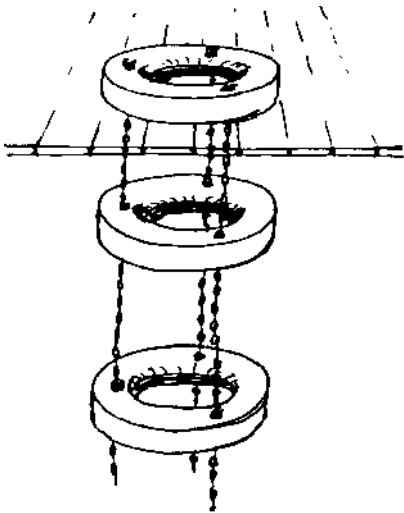
**Note**

Show attached to centre of bridge or tire net but can also be attached through centre or a deck with tire bolted in place on upper surface of Deck.



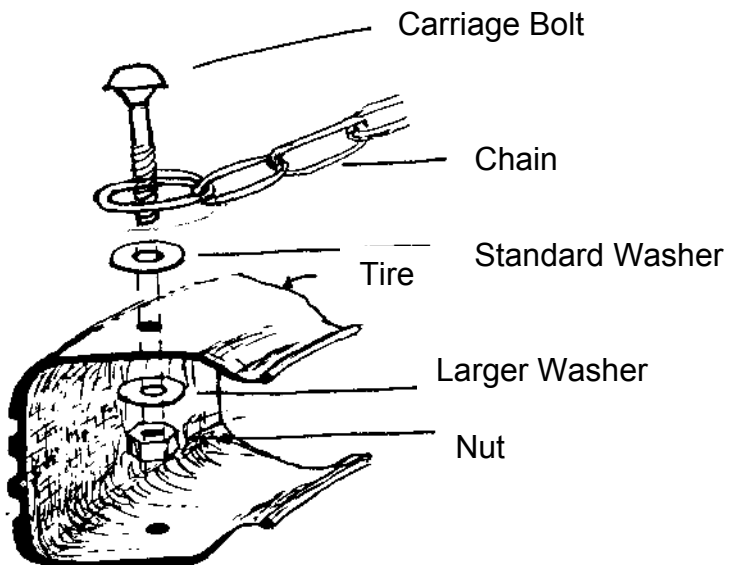
## Tire/Chain Ladder (continued)

Tyre bolted in place



Three Chains at a distance  
around Tire Top and Bottom

Join Chain to  
Tire with  
Carriage Bolt  
Connection



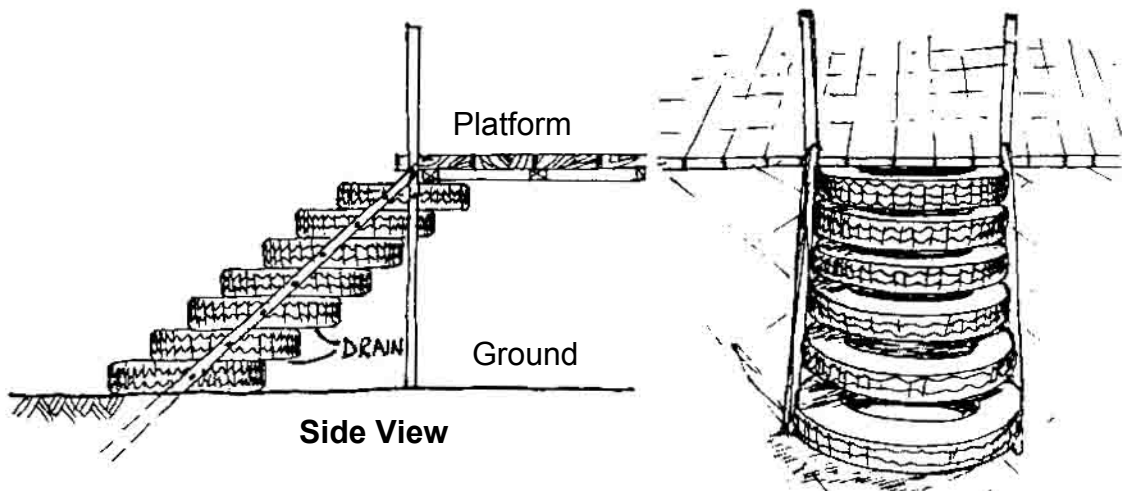
Climbing  
**Inclined Tire Steps**

**Materials**

- 2 – 12 Wooden Beams
- 20 – 3/8" x 3 Lag bolts
- 10 – 3/8" x 2 1/2" Standard Bolts
- 10 – 3/8" Nuts
- 40 – 3/8" x 3" Washers
- 8 – 10 Auto Tires (Depending on length to be spanned)

**Tools**

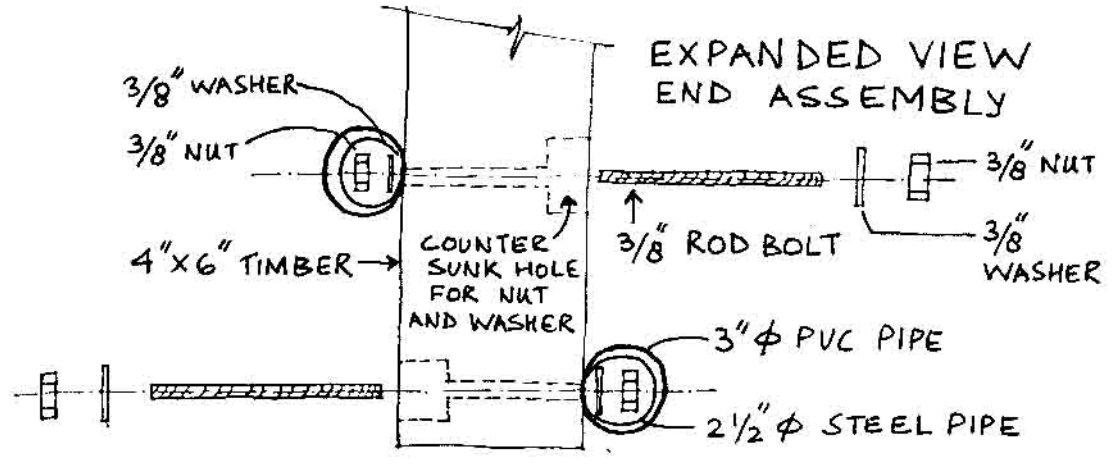
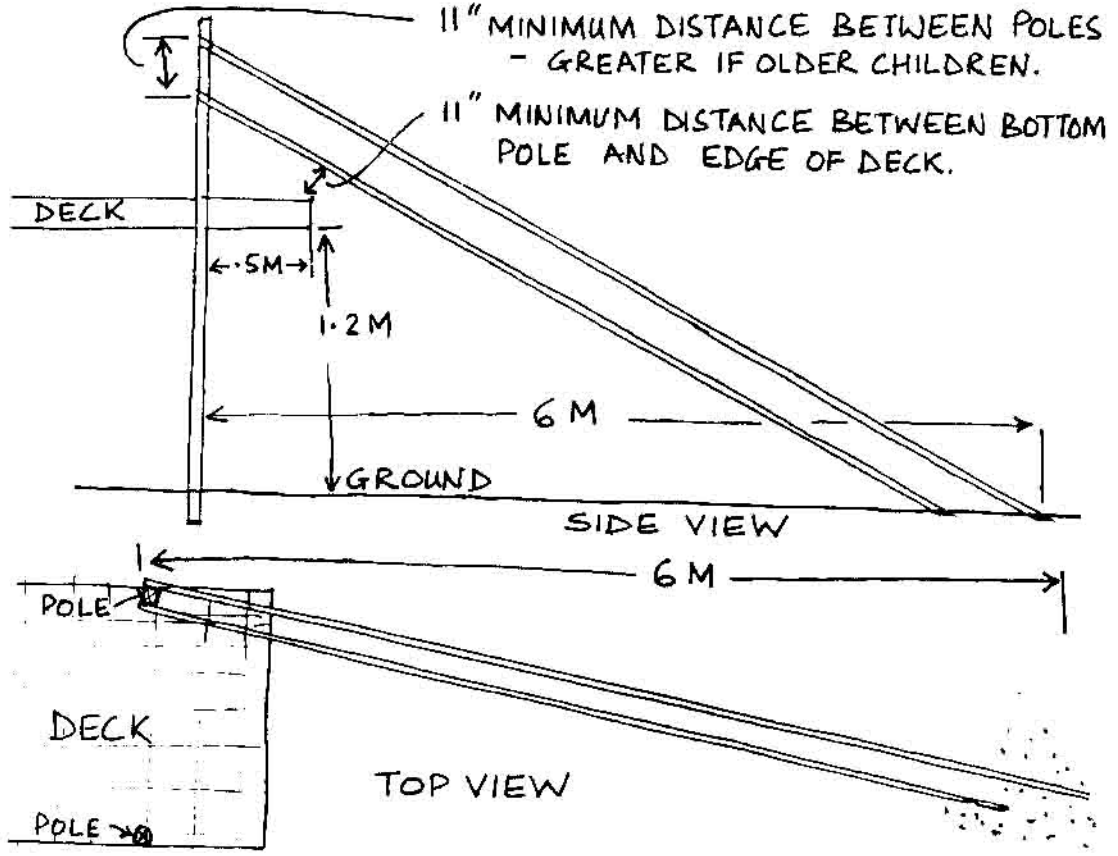
Same as tire ladder



**Notes**

1. Lag bolts at each wood to tire touch point and standard bolts at each tire to tire touch point.
2. Be sure drain holes are in each tire and tilt slightly back to aid drainage.

Climbing  
**Bannister Slide**



Swinging (Group or solitary)

## Tire Swing Seat

### Materials

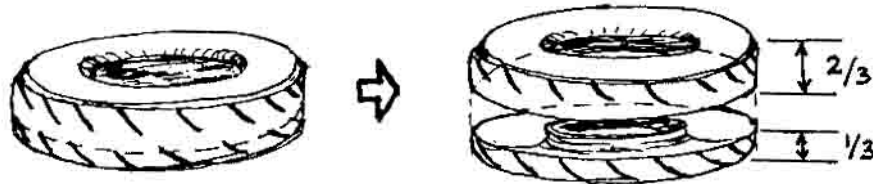
- 1 – Non steel belted tire (size depends on how many children you want to have on the swing at one time)
- 4 – 3/8" x 2 1/2" Carriage bolts
- 4- 3/8" x 3" Washers
- 4- 3/8" Hex- head nuts
- 1/4" proof coil chain  
(Length depends on height of frame)

### Tools

Sharp knife 9/16" Spanner, Hack Saw, Hammer.

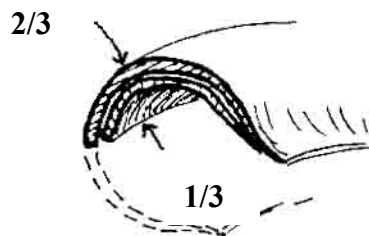
### Step 1

Cut tire around circumference of tread and separate

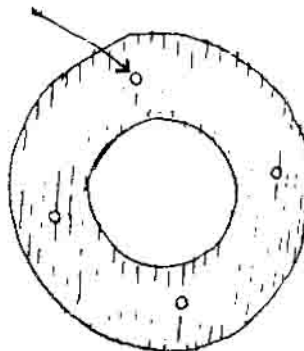


### Step 2

Reverse 1/3 section and sandwich into curve of 2/3 section so that sidewall strength is doubled.



Holes large enough for bolts to pass through



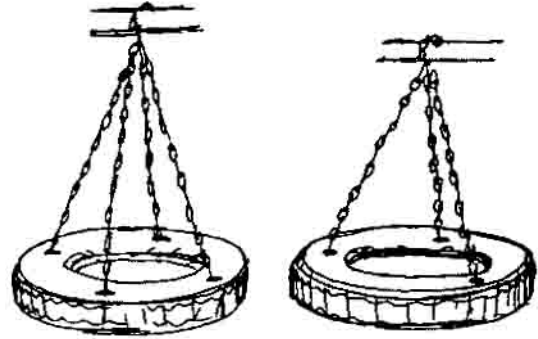
### Step 3

Drill (cut) 4 holes through Sidewalls at equal distances

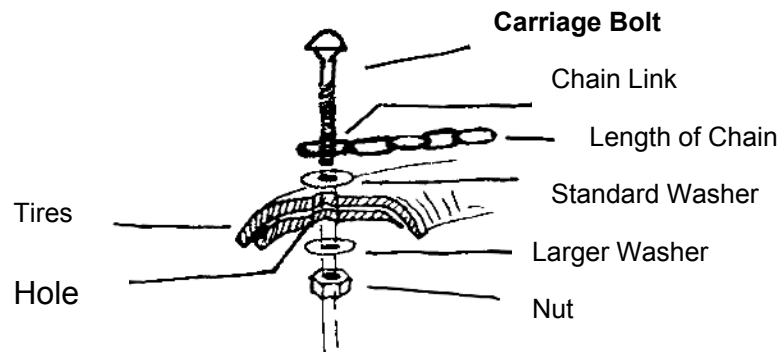
## Tire Swing Seats (continued)

### Note

This seat can be hung with all four chains coming up to a single point for swivel tire swing, or else, two chains at two separated points for to / fro type of swing.



### Step 4 Assemble

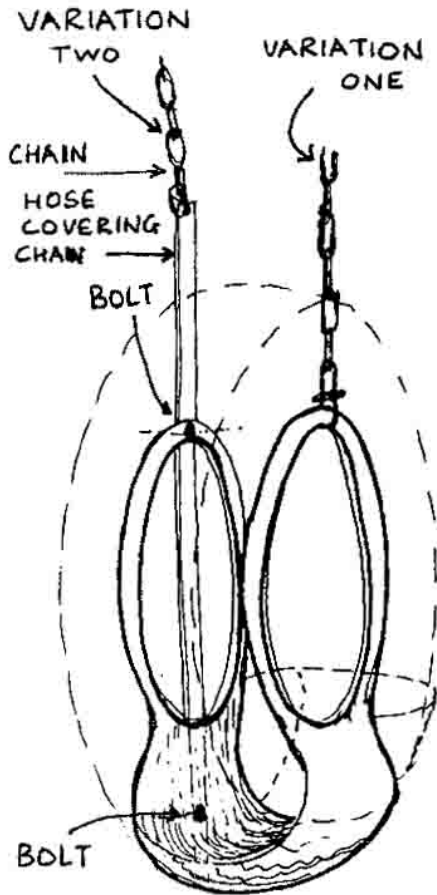


### Step 5

1. Cut excess bolts leaving approximately 1/16" past nut.
2. Hammer end of bolt to mushroom end so that the bold and the nut do not separate.



Swinging (Solitary)  
Tire swing seat single



**Materials**

Variation One

- 1 Non steel belted Tire
- 1/4" Proof Coil Chain
- 1/4" Shackle

Variation Two

- 1 Non steel belted Tire
- 1/4" Proof Coil Chain
- 4, 1 1/2" x 3/8" Carriage Bolts
- 4, 3/8" Nuts
- 12, 3/8" Standard Washers
- 6 feet rubber hose to fit over chain.

**Step 1**

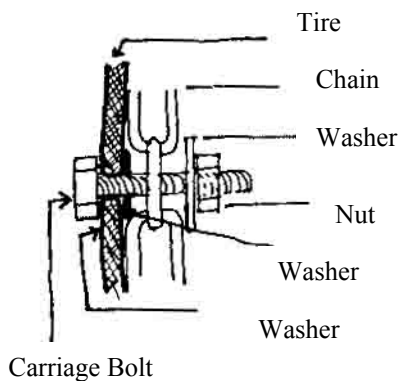
Cut tire leave rim and some sidewall to bolt the chain and enough of the tread to have seat and back turn inside out

**Step2**

Assemble according to 1 and 2.

**Note**

Chain length is according to height of swing frame.



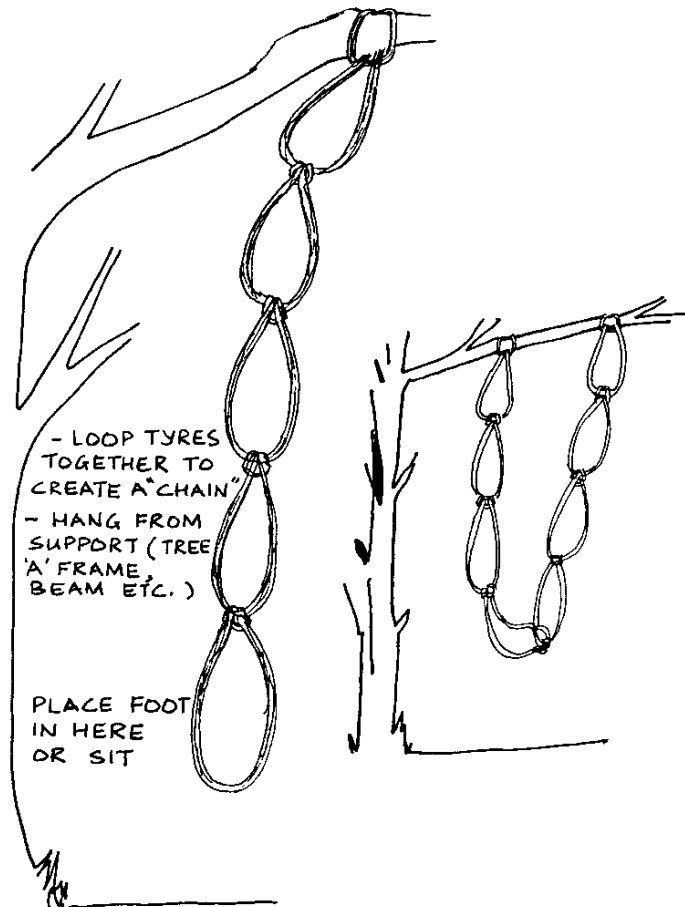
Variation: Leg holes can of seat for young children.

Swinging  
**Bicycle tire swing**

**Materials**

Bicycles tires

(Number will depend on height of branch sturdy tree branch.)



Children tend to create this pretty much on their own but it never hurts to have materials and give suggestions ...

**Variation: Double**

**Note**

For this work the last "loop" must be able to slip over the end of the support "limb".

## Water Water Table

### Materials

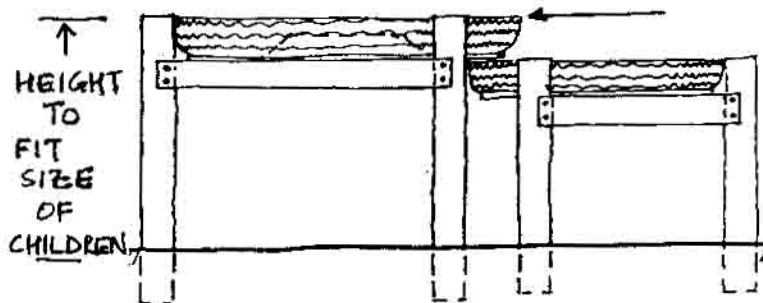
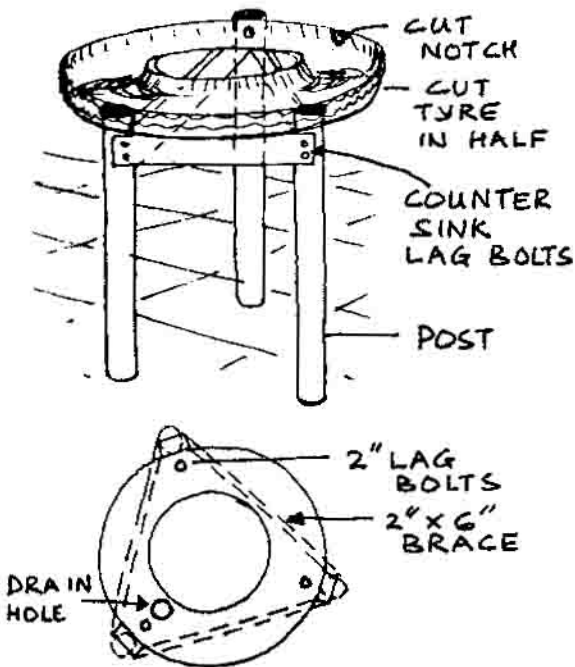
(Woods) 2 Tables  
3 – 4" Diameter x 5'  
Posts  
3 – 4" Diameter x 4'  
Posts  
6 – 2" x 6" x 2'6" Boards  
24 – 3/8" x 3" Lag bolts  
6- 3/8" x 2" Lag bolts  
30 – 3/8" Flat washers

### Tools

Digging Bar  
Brace + 5/16" Bit + 1" Bit  
Socket Wrench Set  
Sharp Knife

### Note

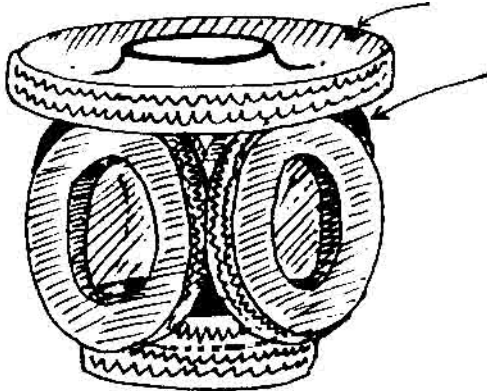
1. The larger the tire used the more children around the table
2. Cut tires along tread with knife. Use sharp knife and pull tire open while cutting.
3. Water source can be tap, hose or pump.
4. Notch needs to be cut lower than inside rim of tire cut wooden plug to place in drain hole during use.
5. Cut wooden plug to place in drain hole during use.



See Note Number 4

Water  
**Water table variation**

Cut notch



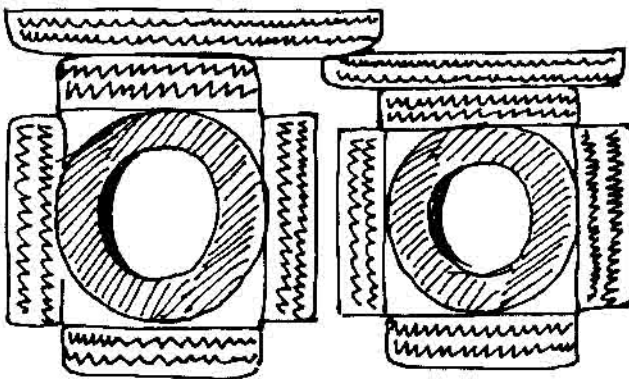
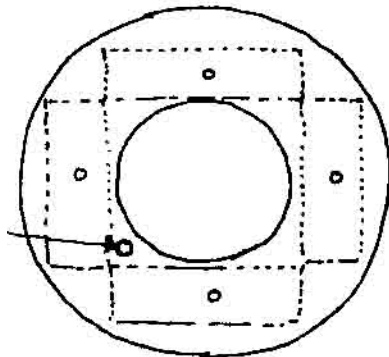
Tire Table

Instead of using a wooden table to support the tire water tray it could be placed on a table made entirely of tires (see tire cube for details).

The tire cube table will last for a long time.

It will neither rust nor rot.

Drain Hole

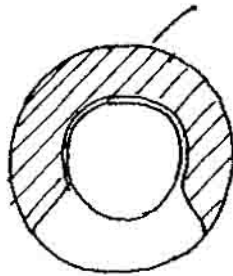


## Sand Tire Bucket

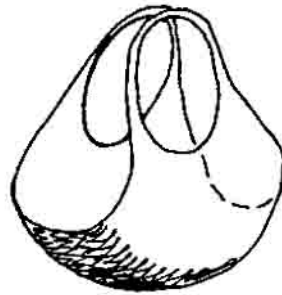
Materials  
Non Steel Belted tire  
(Worn Thin)

Tools  
Knife

Tire to be cut away



Turn Tire inside out after cutting

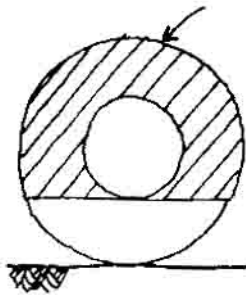


Note

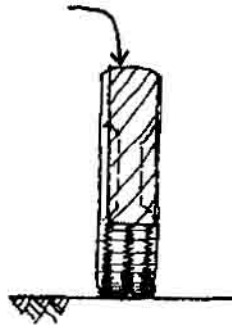
Can be left loose or attached to pulley to transport sand.

## Landscaping Tire Planters

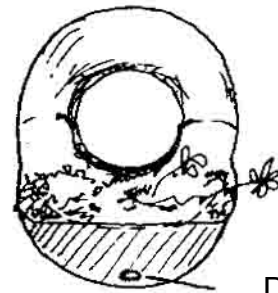
Portion to be cut away



Front



Side



Drain hole

Turn tire  
Inside-out.

Note

Hang on hook by inside rim. Fill with any 'pot' type plant – flowers, vines etc.

Dramatic, Sand, Quiet  
**Tire table and seats**

**Materials**

(Table)

3 – 4 Large Truck Tires

1 large Cable Spool End

3 – 4 Lag bolts  $\frac{3}{8}$ " x 3"

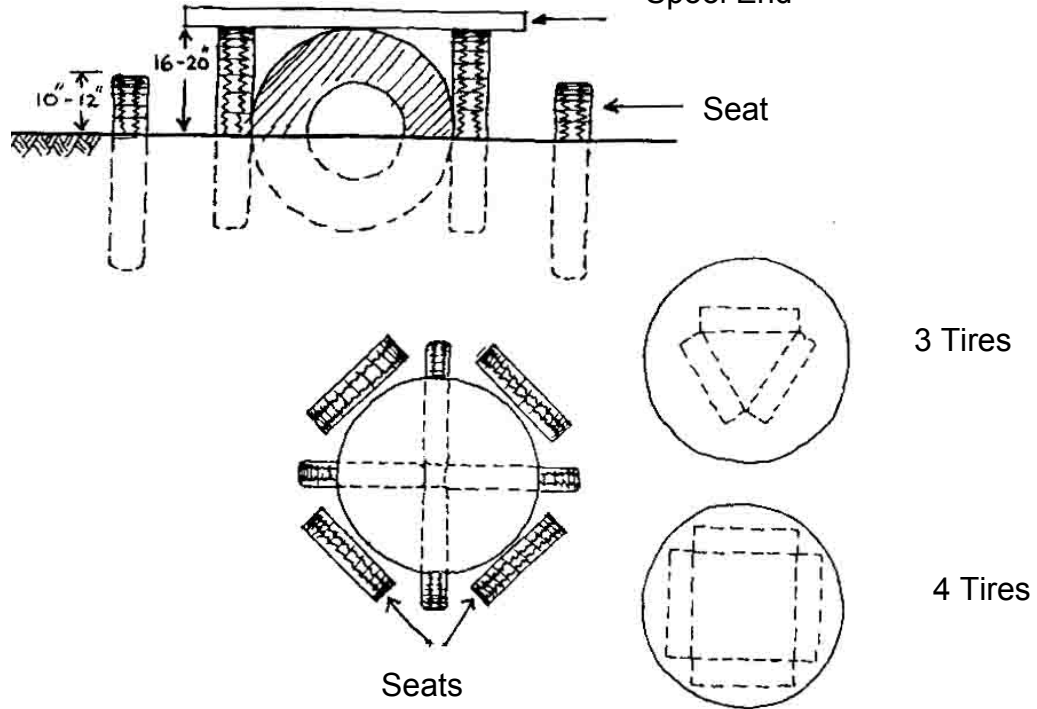
3 – 4,  $\frac{3}{8}$ " x 3" Washers

(For Seats) 4 – 6 large Light Truck Tires

**Tools**

Same as Tire Ladder  
Shovel

Wooden Cable  
Spool End



**Notes**

Place seats around table close enough for children to sit at the table.

Can also be built without seats lower to ground using smaller tires.

The above table can also be a platform if large tires used balance beam etc.

Can radiate out from (see Balance Beam page) by cutting into tire.

Climbing, Fantasy, Sand

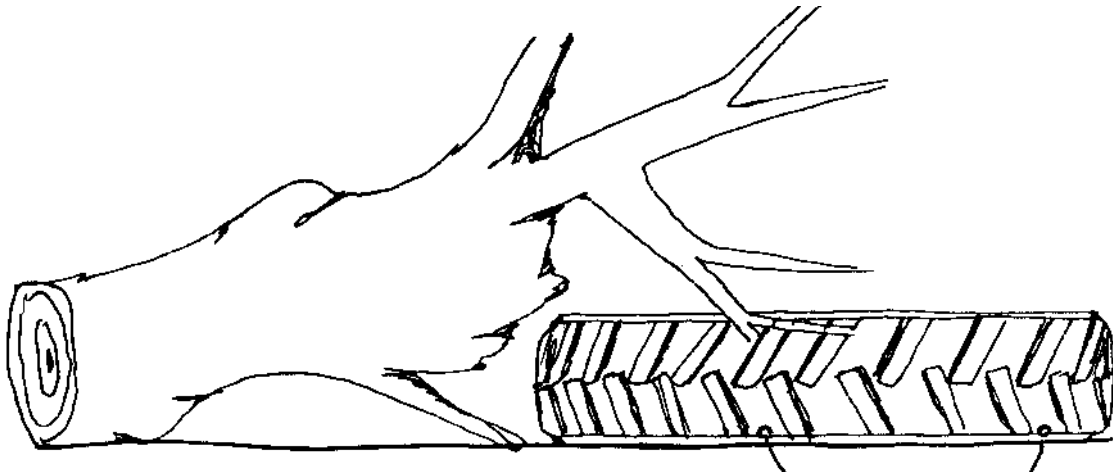
## Tire Pit

### Materials

One huge tire (Larger the better)  
One old tree trunk with some branches attached

### Tools

Hot Iron Rod



Drain Holes

### Note

This can be a low level climbing  
area or if partially filled with sand it becomes a sand play area.  
If no tree trunk is available  
then either of the tire stairs can be attached to provide access (or both!)

Dramatic Fantasy  
**Tire Barrel Tunnel**

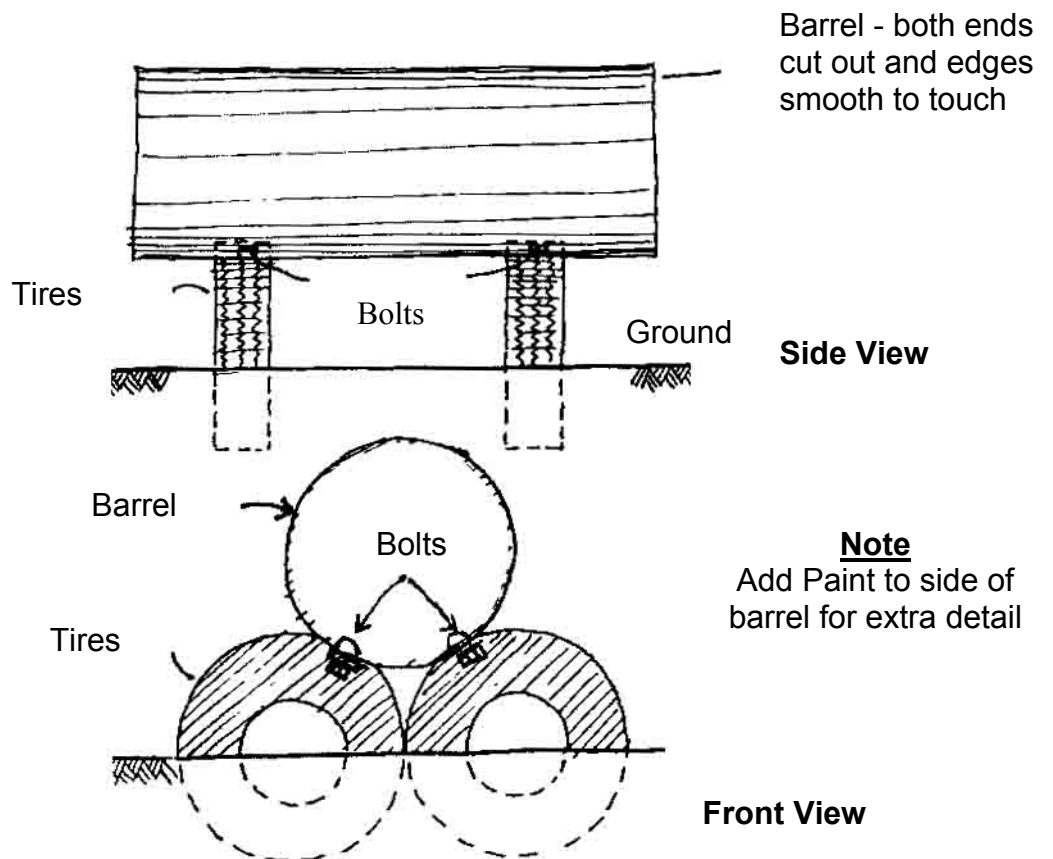
**Materials**

(Per tunnel)

- 4 –Auto Tires
- 1 – Metal or Plastic drum (Barrel)
- 4 – 3/8" x 2" Carriage Bolts
- 4 – 3/8" Nuts
- 4 – 3/8 Standard Washers
- 4 – 3/8" x 3" Standard Washers

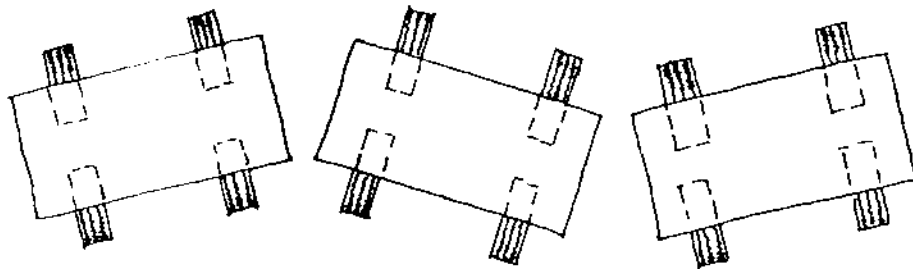
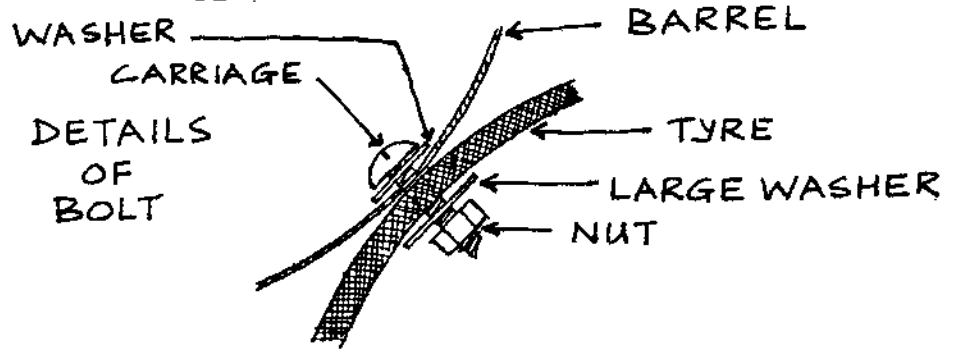
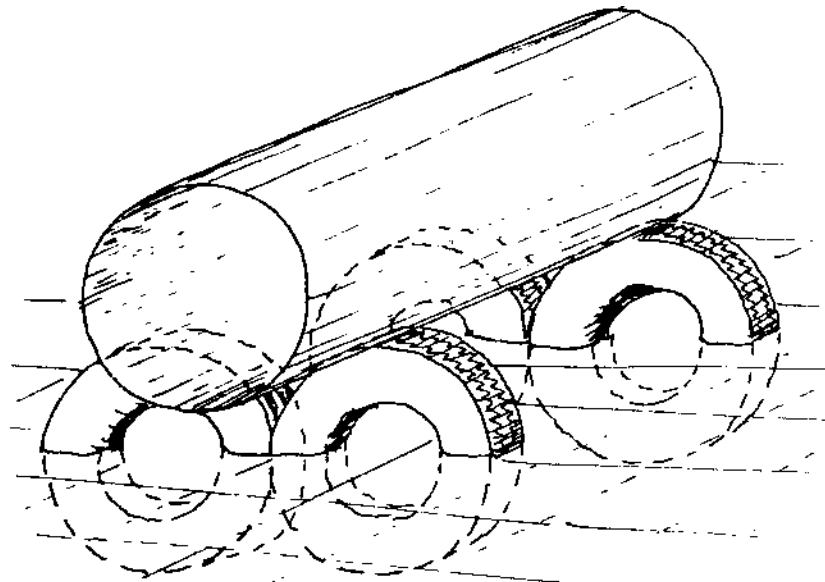
**Tools**

- Electric Drill + 3.8" Metal Drill Bit
- 9/16" Spanners
- 9/16" Socket + Ratchet
- Shovel





## Tire Barrel Tunnel (continued)



### Note

Can be set up to make a train.

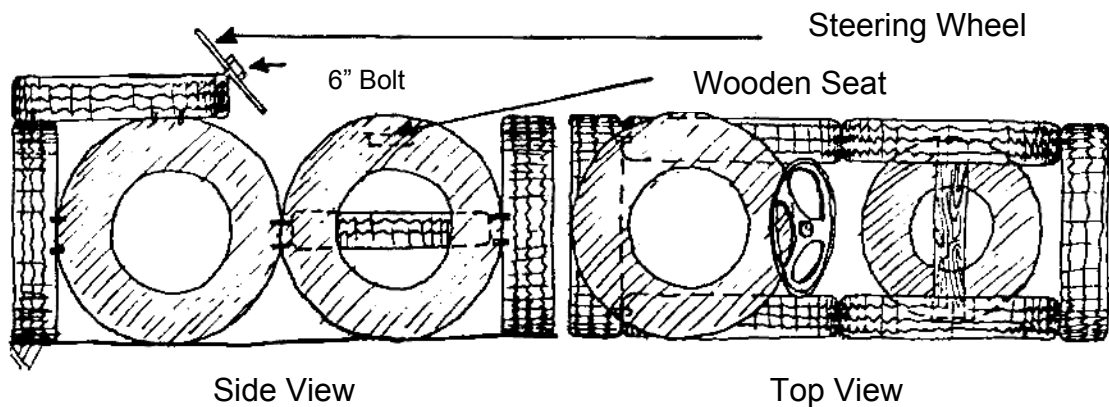
## Dramatic Tire Car

### Materials

- 7, Same size Auto Tires
- 1, Slightly small Auto Tire
- 21, 3/8" x 2 1/2" Standard Bolts
- 22, 3/8" Hex Head Nuts
- 48, 3/8" x 3" Washers
- 1, 2" x 6" x 3ft. Wood Board
- 1, 3" x 6" x 6" Wood Block
- 1, Steering Wheel
- 1, 3/8" x 6" Standard Bolt
- 4, 3/8" x 3" Lag Bolts

### Tools

Same as Tire Cube and Tire Ladder, Sharp Knife



### Notes

1. On side tires two bolts are used at each tire contact point.
2. On top tires and inside tire under seat one bolt at each tire contact point.
3. Use knife to insert seat board cut before final bolts put in.
4. Use Lag Bolts front tread and bottom side-wall to secure wood block inside tire for steering wheel.
5. Hole slightly larger than bolt so wheel turns freely.

Climbing, Landscaping

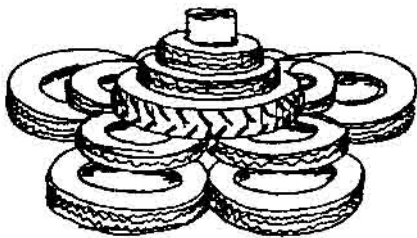
## Tire Mound

### Materials

- 6 – Truck Tires
- 6 – Light Truck Tires or large Auto Tires
- 1 – Tractor tire
- 1 – Approximately 2 meter long Coconut log.

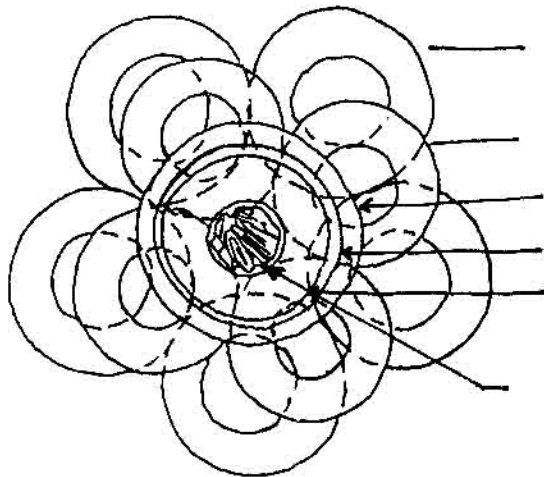
### Tools

- Shovels
- Digging Bar



### Notes

- Place log approx. 600 mm. into ground.
- Arrange each layer and fill with sand.
- Be sure to push sand under lip edge of each tire to fill solid.
- Be sure to fill space between log and tires.
- Tires should touch to hold sand in place.



Layer 1 – Truck Tires

Layer 2 – Light Truck or Auto Tires

Layer 3 – Tractor Tire

Layer 4 – Truck Tire

Layer 5 – Light Truck, Auto Tire

Upright Log

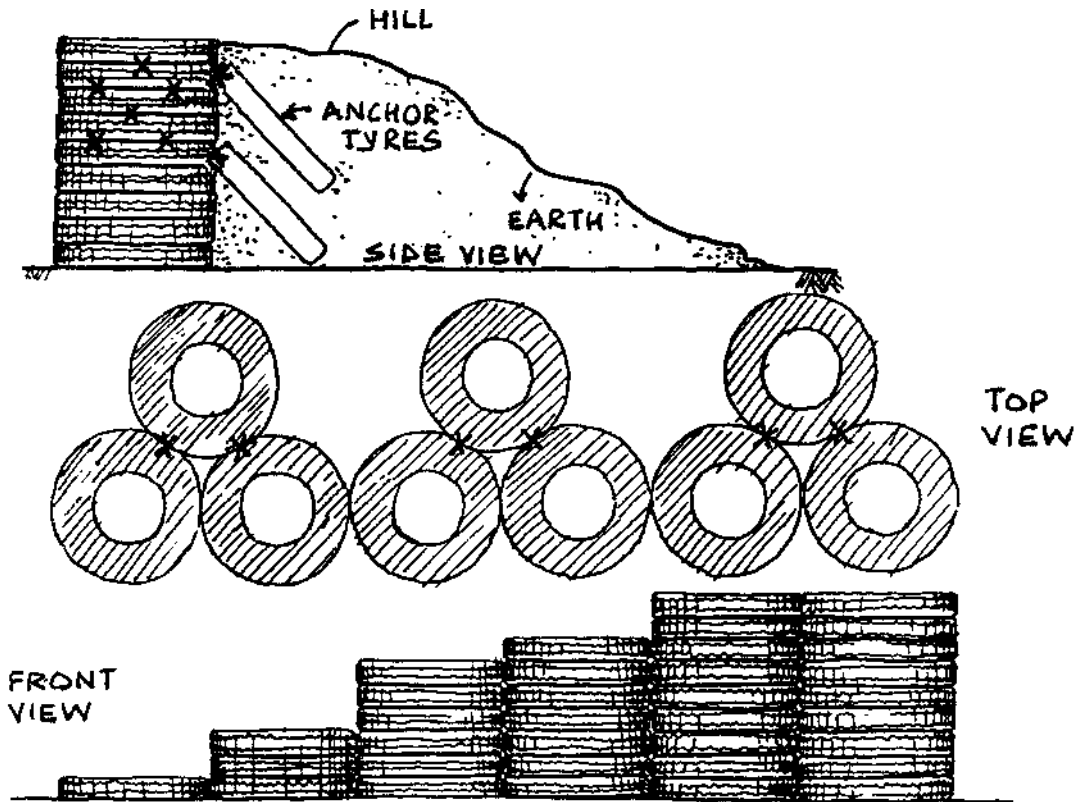
Climbing, Landscape  
**Tire Wall**

**Materials**

Amount of materials will depend on height and length of wall  
Approx. two connections per anchor tire and one at other points  
3/8" x 2 1/2" Standard Bolts  
3/8" Hex Head Nuts  
3/8" x 3" Washers

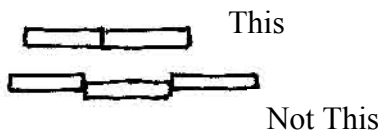
**Tools**

Same as Tire Cube, Shovels



**Notes**

1. Bolts should be at each "X" point.
2. Lower tires need not be bolted, as their weight will hold them in place.
3. Fill each layer of tires. Make sure to push earth under rim of tires (overstuff).



Tires stacked eight (8) high makes a wall approx. 4 feet high.  
Be sure each layer is level so that the next level will lay correctly.

Fantasy Dramatic  
**Tire Tunnel/Cave**

**Materials**

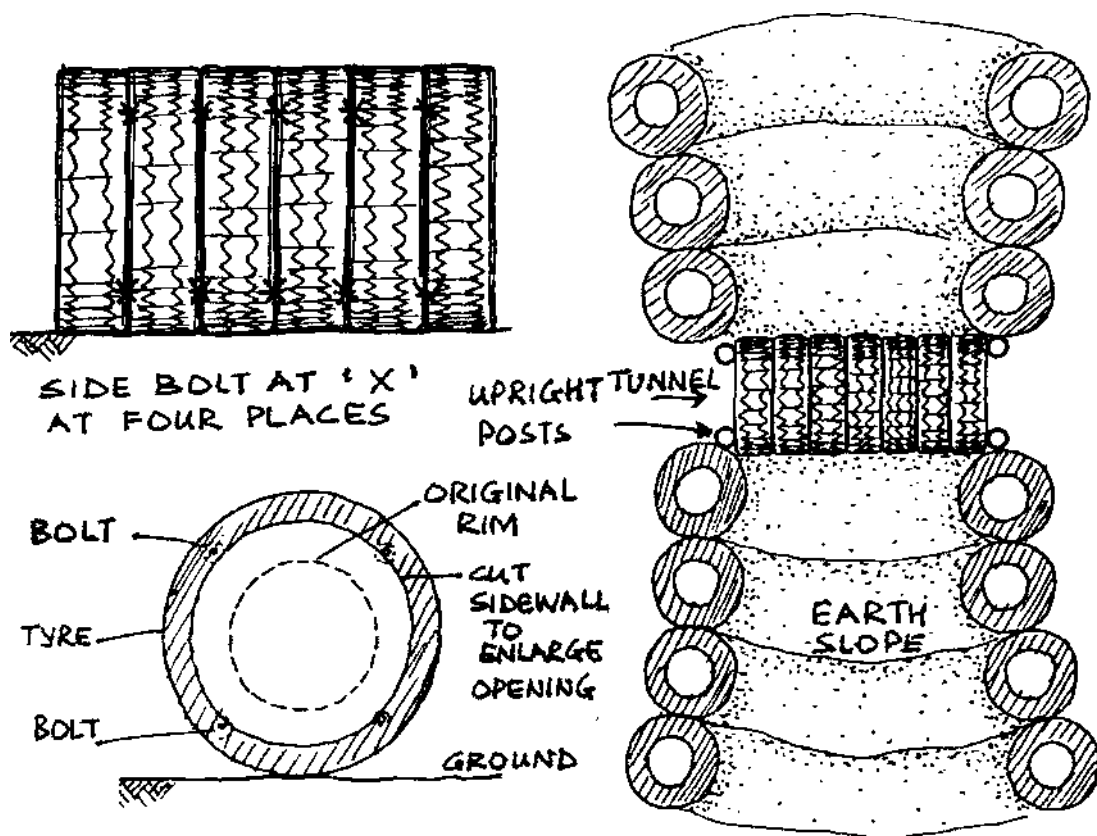
- 5 – Large Tractor Tires
- 16 – 3/8" x 3" Standard Bolts
- 16 – 3/8" Nuts
- 32 – 3/8" x 3" Washers

**Tools**

- Sharp knife or electric Jigsaw
- Same tools as Tire Cube
- Shovel

**Note**

Can be buried inside hill to create cave or tunnel effect.  
Should be used with tire embankment walls bolted to upright posts.



Safety / Dramatic  
**Tire Portals and Bumper Guards**

**Materials**

2 Large Tractor Tires

**Tools**

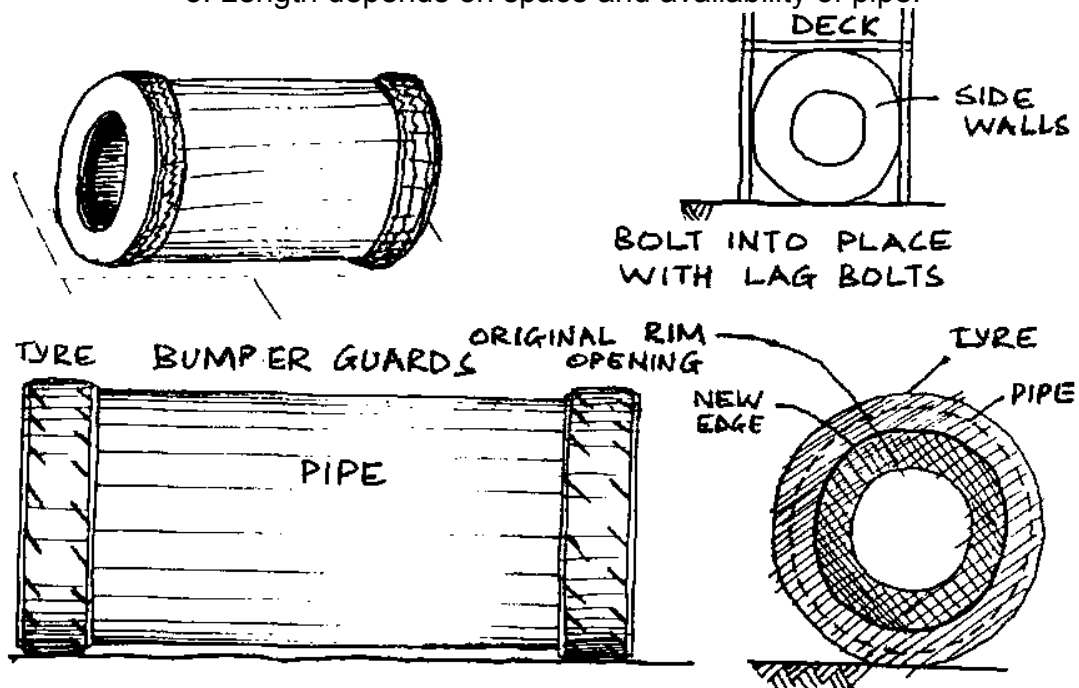
Jig Saw or Sharp knife

-Portals-

Use cutaway sidewall to create round entranceways between posts etc.

**Note**

1. This is used where concrete sewer pipe is used to create tunnel or cave in a hill.
2. Pipe should be approx. 4 Diameter
3. Length depends on space and availability of pipe.



**Notes**

**Step 1**

Mark diameter of pipe on sidewall of tires - cut away with jigsaw or knife - slightly smaller than pipe.

**Step 2**

Stretch tire over end of pipe and push onto pipe.

**Step 3**

Cut inner rims away but leave enough sidewall to cover edge of pipe.

Landscape  
**Tire Enclosure**

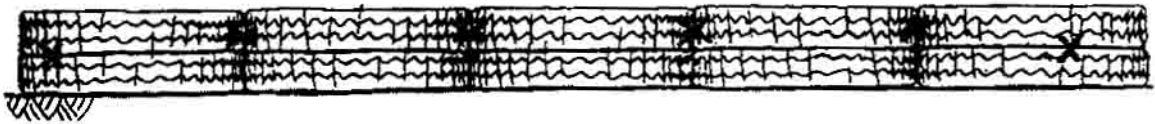
**Materials**

Varies according to length of area to be enclosed – usually only two tires high to retain and define where digging may not be practical such as hard rock, concrete or poor drainage areas.

- Use same bolts as cube at points indicated with “X”
- If used to retain area of fine sand then back up tire wall with fibre matting to hold sand from leaking between tire joints and allowing water to pass through.

**Tools**

Same as Tire Cube.

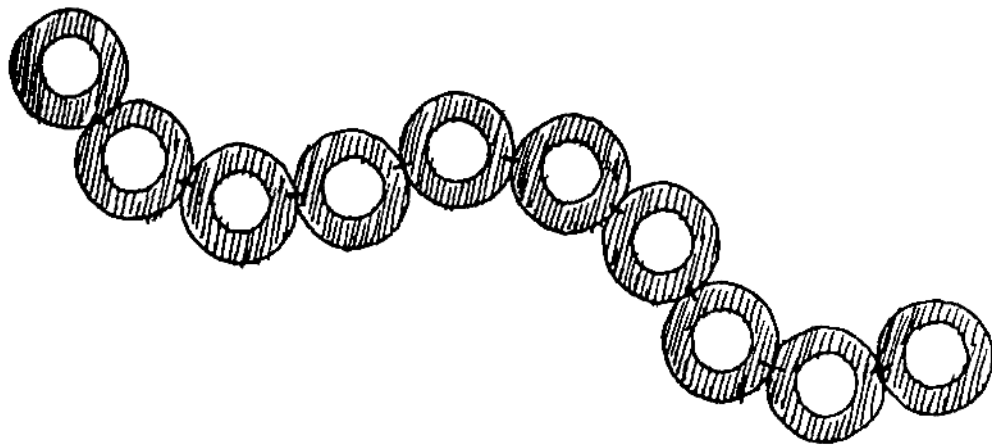


- Bolt entire length of top row and down to bottom row on every fifth (5) tire to secure row from shifting

Curves

Straight lines

Angles.



Landscape  
**The Pyramid Garden**

**Materials**

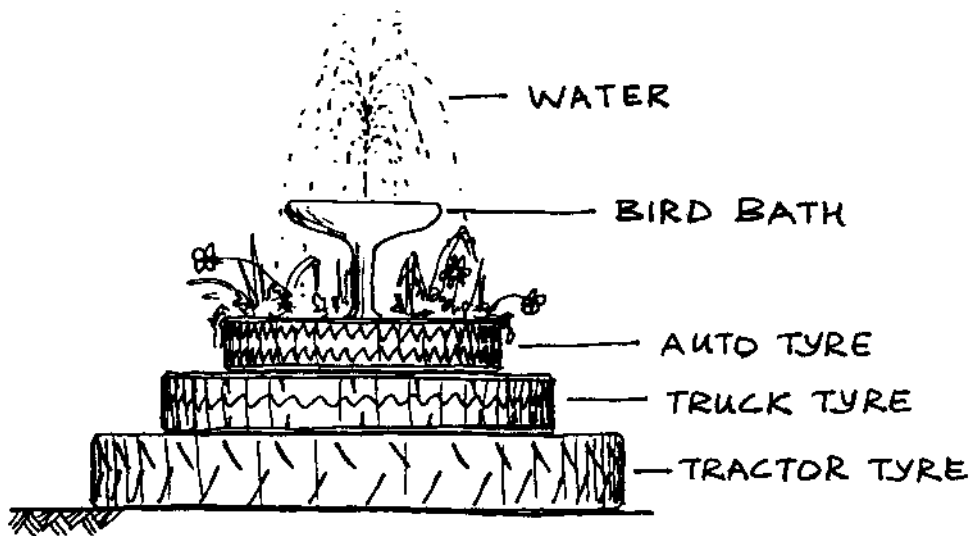
- 1 – Large Tractor Tire
- 1 – Large Truck Tire
- 1 – Large Auto Tire
- 1 – Bird Bath

**Tools**

- Jigsaw with rough cut wood blade
- Sharp knife
- Shovel

**Note**

1. Cut one sidewall off each tire as close to the tread as possible.
2. Fill each tire with earth as stacked.
3. Run pipe through centre and connect to birdbath.





Dramatic Fantasy  
**Tire Boat**

**Materials**

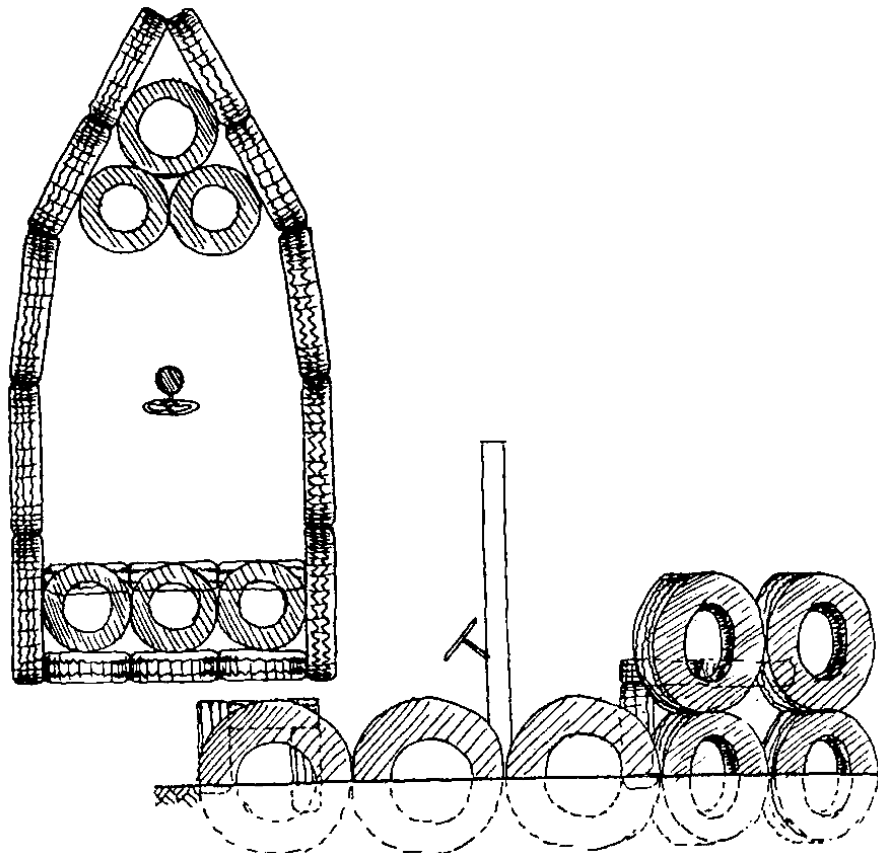
Tires –Truck or Larger Auto (depending on space)  
3/8" x 2½" Standard Bolts  
3/8" Nuts  
3/8" x 3" Washers  
1 – Long Post  
1 – Old Steering wheel  
1 – 3/8" x 4" Lag Bolt

**Tools**

Same as Tire Cubes  
Shovel

**Note**

1. Attach wheel to post with lag bolt (if metal post used then weld bolt) and attach when so that it turns freely.
2. Ropes can be attached to post down to tires to give a feel for the boat.
3. Net can also be attached form front upper deck to floor or to outside.
4. Can also be set alongside wooden platform to act as Dock.



Dramatic Fantasy  
**Tire Alligator**

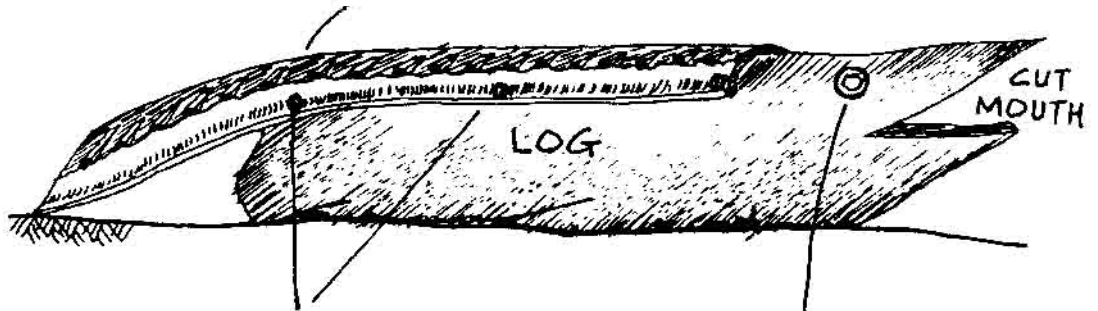
**Materials**

- 1 – 6' Round Post or Log
- 1 – Non Steel Belted Tire
- 8 – 3/8" x 2" Lag Bolts
- 8 – 3/8" Standard Washers

**Tools**

- Knife or Jigsaw
- 9/16" Spanner
- Saw

Cut tire tread for skin



Bolt on each side to  
attach tire tread

Bolt -and-washer "eyes"

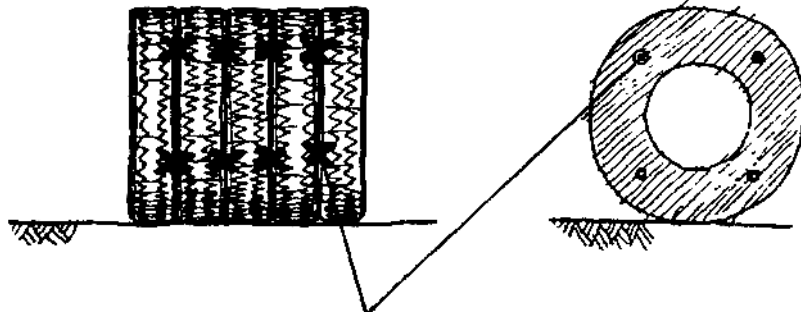
Loose Movable  
**Tire Roller**

**Materials**

- 5 – Wide off road Auto Tires
- 16 – 3/8" x 3" Standard Bolts
- 16 – 3/8" Nuts
- 32 – 3/8" x 3" Washers

**Tools**

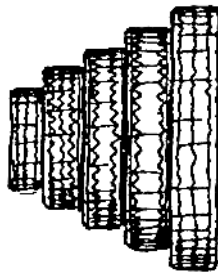
Same as Tire Cubes



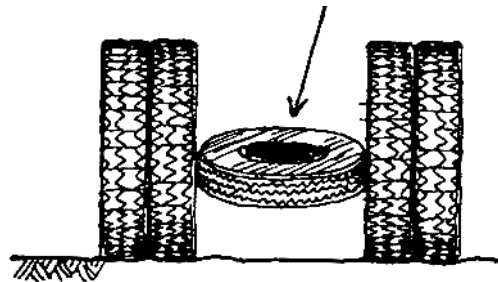
Bolt at four places around the tire.  
It can be used by children to “walk” on  
as it rolls on the ground.

**Variations**

Each tire slightly larger –  
will cause roller to move/turn in circles.



Slightly smaller tire than  
outside one.



Quiet (Group)

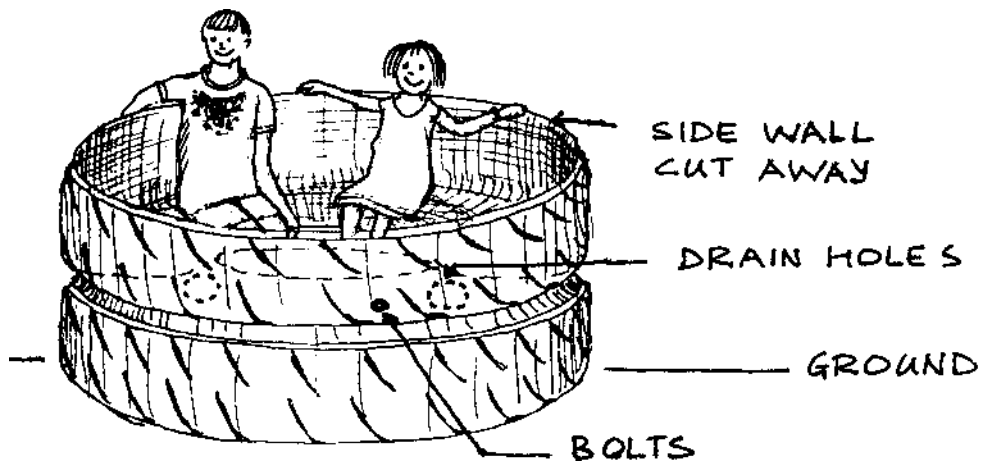
## Tire Bench

### Materials

- 2 – Large Tractor Tires
- 3 – 3/8" x 3" Carriage Bolts
- 3 – 3/8" Nuts
- 3 – 3/8" Standard Washers
- 32 – 3/8" x 3" Washers

### Tools

- 9/16" spanner
- Electric drill with bit, or
- Hot Iron bars, jigsaw or Sharp Knife



### Notes

1. Cut sidewall from one tire leave bottom sidewall to create "seat" inside tire.
2. Stack on second tire that has been buried approximately halfway.
3. Drill drain holes through (or cut with knife) in both tires children sit inside the circle facing each other.

Quiet (Group)  
**Tire Seats + Amphitheatre**

**Material**

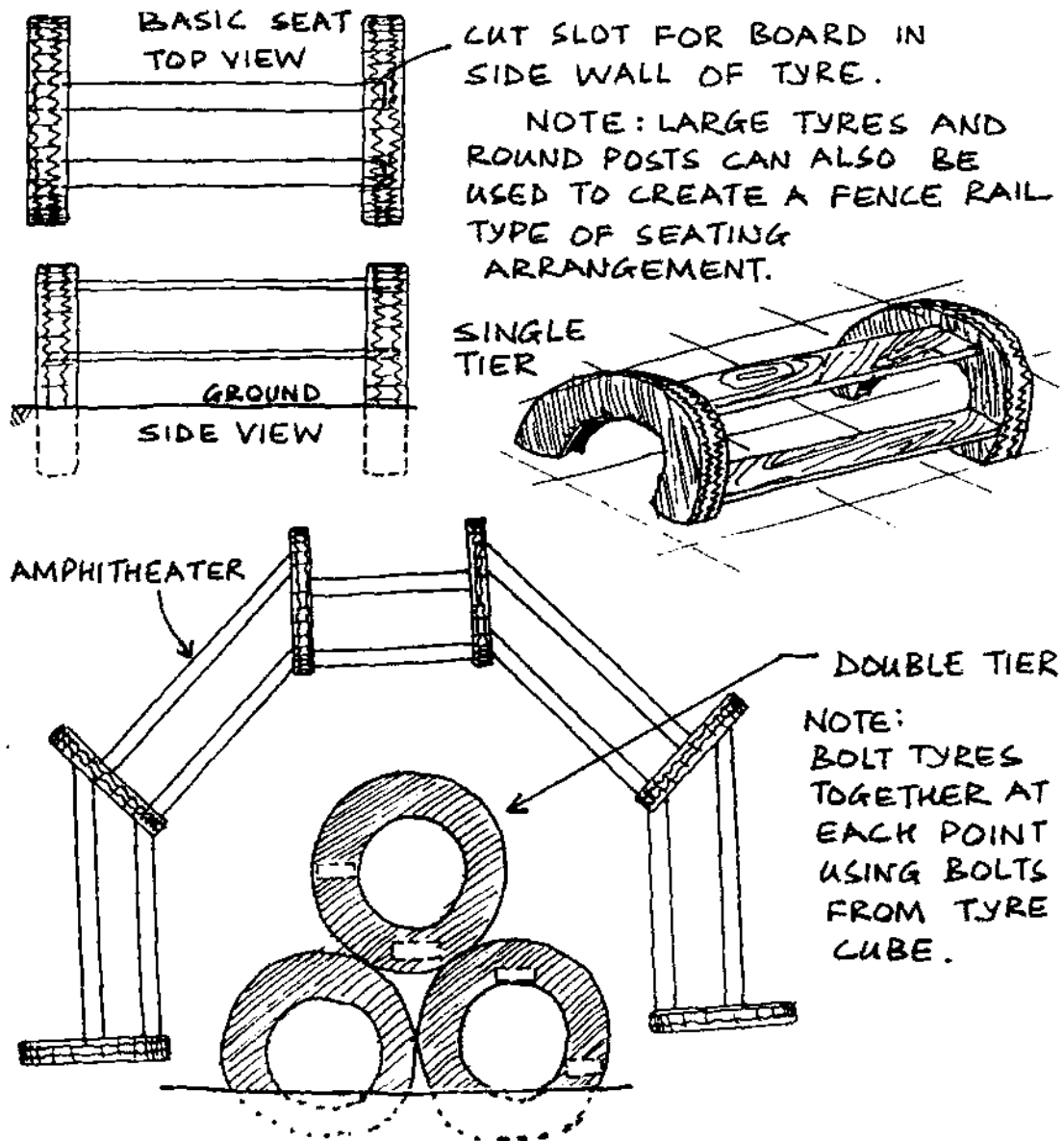
Per Seat

Large Truck / Tractor Tires (2)  
2" x 6" Boards

**Tools**

Shovel

Sharp Knife



Safety  
**Tire Railing**

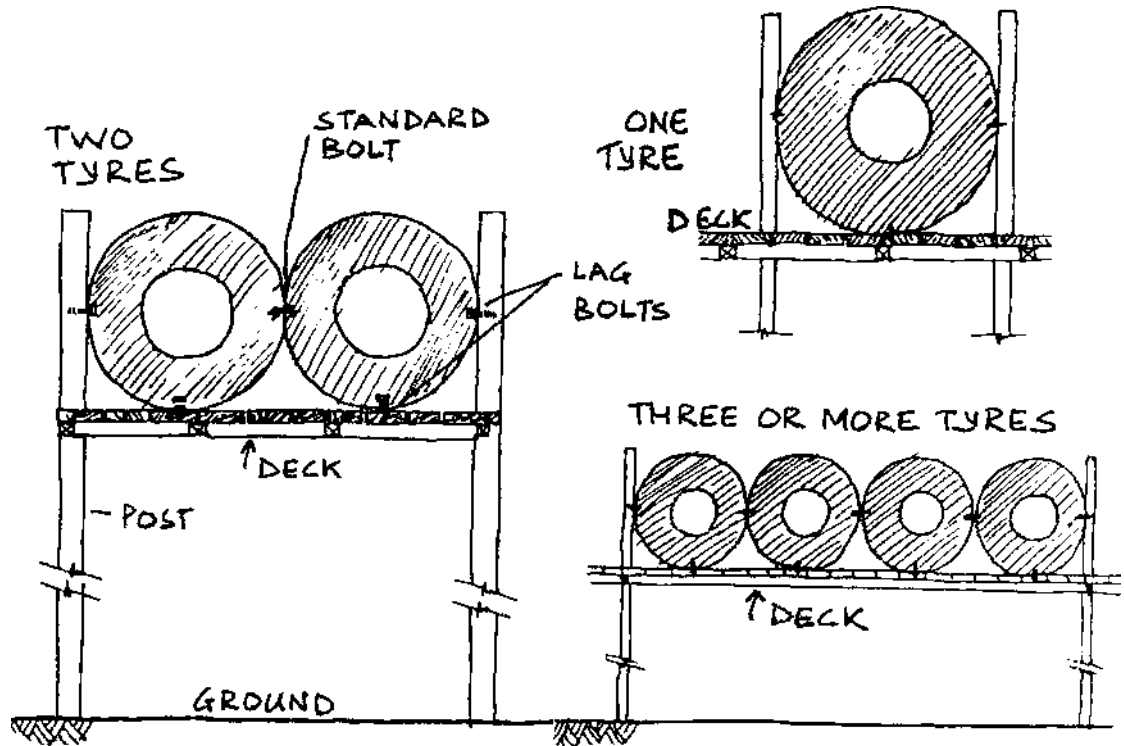
**Materials**

- Auto Tires
- 3/8" x 3" Lag Bolts
- 3/8" x 2 1/2" Standard Bolts
- 3/8" Nuts
- 3/8" x 3" Washers

**Tools**

Same as Tire Ladder

To be used on upper decks to create rails children aren't pushed off and to define enclosed space on upper deck.



Movement (Solitary) Fantasy

**Tire Teeter-Tooter**

**Materials**

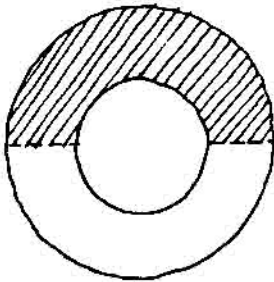
1 Large Truck Tire  
2 – 1½” Diameter x 1 ft. Wooden Dowels.

**Tools**

Hacksaw  
Sharp Knife

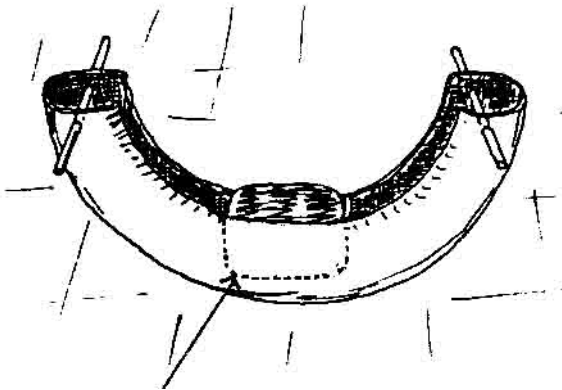
**Note**

Cut Tire in Half



Use hacksaw to cut metal cable at edge of inside rim.  
Use knife to cut rest of tire.

Use sharp knife to cut hole near to on either side.  
Make sure they are slightly smaller than dowels so that then will stay in place.



Cut Tire.

Child sits on bottom curve.  
Holds Handle.  
And rock back and forth.  
Seat can be added by cutting short section of tire and slip it over the tire.

Movement (Group)

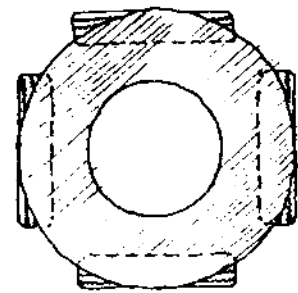
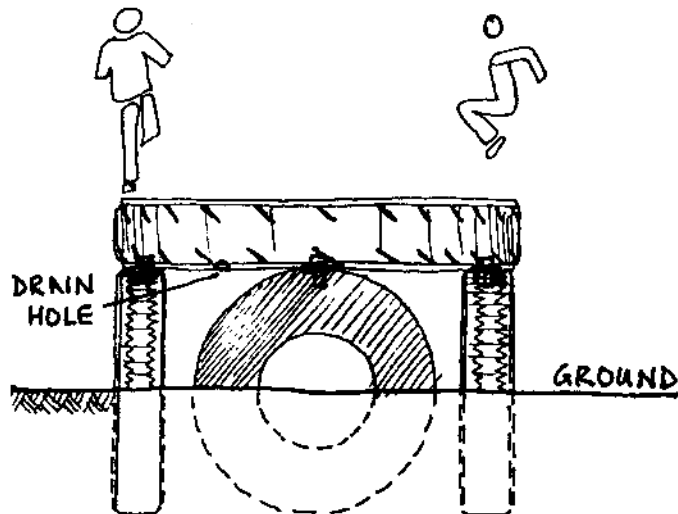
## Tire Bouncer

### Materials

- 1 – Large flexible side wall Tractor Tire
- 4 – Light Truck or large Auto Tires
- 4 – 3/8" x 2½ Standard Bolts
- 4 – 3/8" Nuts
- 8 – 3/8" x 3" Washers

### Tools

Same as tire cube  
Shovel



Top  
View

### Note

Use a large tire with some flexibility to the sidewall.  
Children learn to "Bounce" around the edge like a trampoline.



## Music, Fantasy

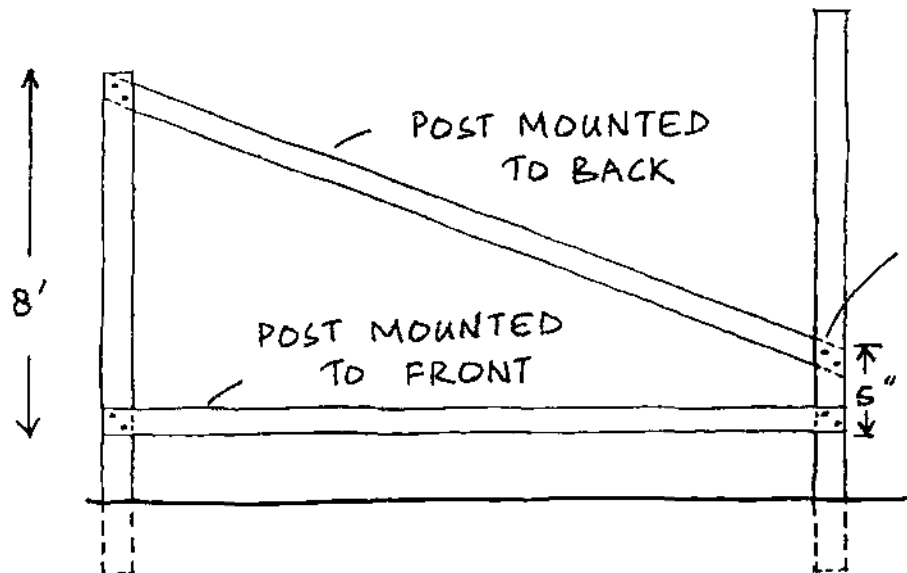
### Po Pipes

#### Materials

- 14 Pieces of P.V.C pipe cut to following lengths –  
2" Diameter, 11' 10", 5' 2", 1' 11½", 10', 4' 8", 1' 7", 9' 2", 3' 8",  
10½", 7' 7", 3', 6' 5", 2' 8½", 8"  
14 – PVC Elbows  
28 – 2" Wall Clamps – 'C' type  
56 – 2" Screws  
2 – 4" x 4" x 12' Posts  
2 – 4" diameter x 12' Posts  
2 – 3/8" x 8" Carriage Bolts  
8 – 3/8" Nuts  
4 – 3/8" Standard Washers  
1 – Small container PVC glue

#### Tools

- Brace + Bit  
3/8" + 1¼"  
Hacksaw Shovel  
9/16" Spanner Screw Driver



## Po Pipes (continued)

### Step1

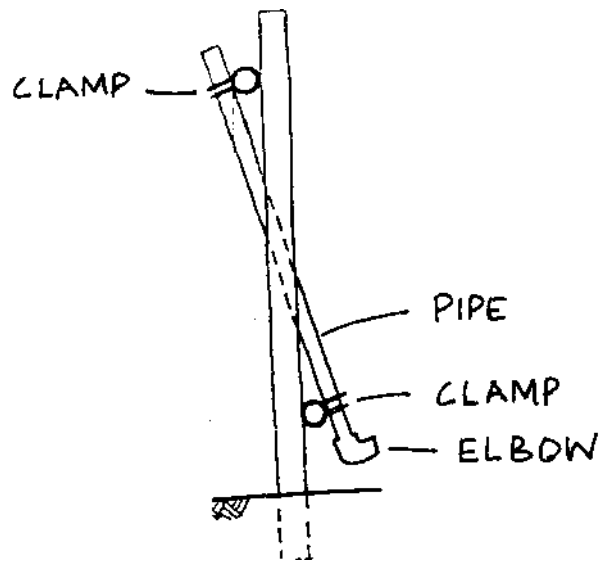
Mount Posts.

### Step2

Mount PVC Pipes from short pipes at small end to longer pipes at large end use clamps.

### Step3

Attach elbows to end of pipes – space pipes evenly along beams.



### Note

If children strike end of open elbow with rubber slipper (flip-flop),  
It will create a tone.

## Music, Fantasy

### Drums

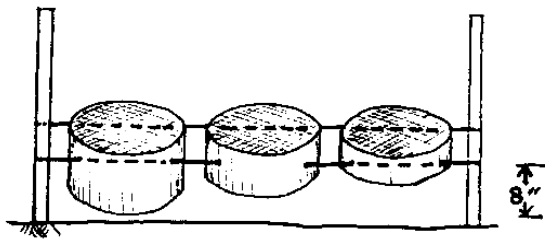
#### Materials

- 3 – Metal or plastic drums (barrels)
- 2 – 4" x 4"x8" Posts
- 2 – 1" Diameter x 10' Steel Pipe
- 4 – 3/8" x 2" Lag Bolts

#### Tools

Something to cut barrels:

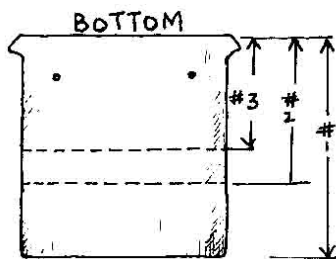
- If plastic, a saw will do. If metal a cutting torch may be needed.
  - 9/16" Spanners
  - 3/8" Hole Punch
- Brace + Bit (1") or Electric Drill



#### Step 1

Cut three barrels so they are approx.

1. Full length with top cut-out.
2. Two-third length with top third cut away.
3. Half of barrel – save bottom half

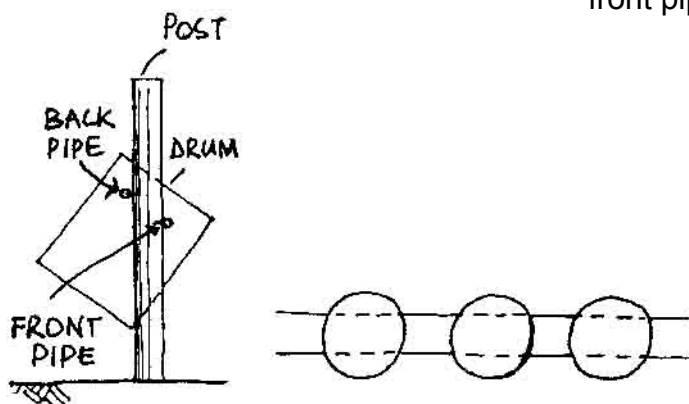


#### Step 2

Drill Hole on each side of barrel so pipes pass through lay pipe on top and mark place for holes along straight line.

#### Step 3

Drill 3/8" Hole in ends of pipe and lag bolt to post with front pipe lower than back pipe drums will angle in.



#### Step 2

## Music, Loose Materials

### Stamping Tubes

This is used as a loose material on playgrounds.  
If you have a supply of bamboo 1" to 3" diameter  
then these are very easy to make.

Cut to lengths and remove the pith inside of each node  
except for the bottom one.

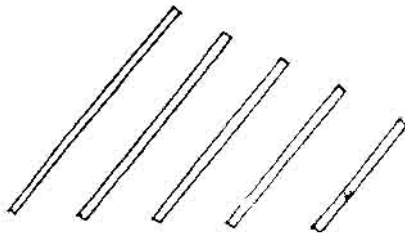
A red-hot poker works well.

If you don't have bamboo then plastic pipe will work well  
but you will need to glue a ¼" thick plywood plug at the end of the pipe.  
2" diameter pipe works best.



The lengths are

68"	54 ¼"	54 5/8"	38 ¼"
61"	51 ¼"	40 ½"	34"



To play them simply strike the end of the ground.

Almost any surface will give a nice sound.

Experiment.

Variation of sounds can be done by putting small rocks inside  
(or bottle caps, marbles etc.) you can also plug both ends with rocks  
inside for a stereophonic rattle.

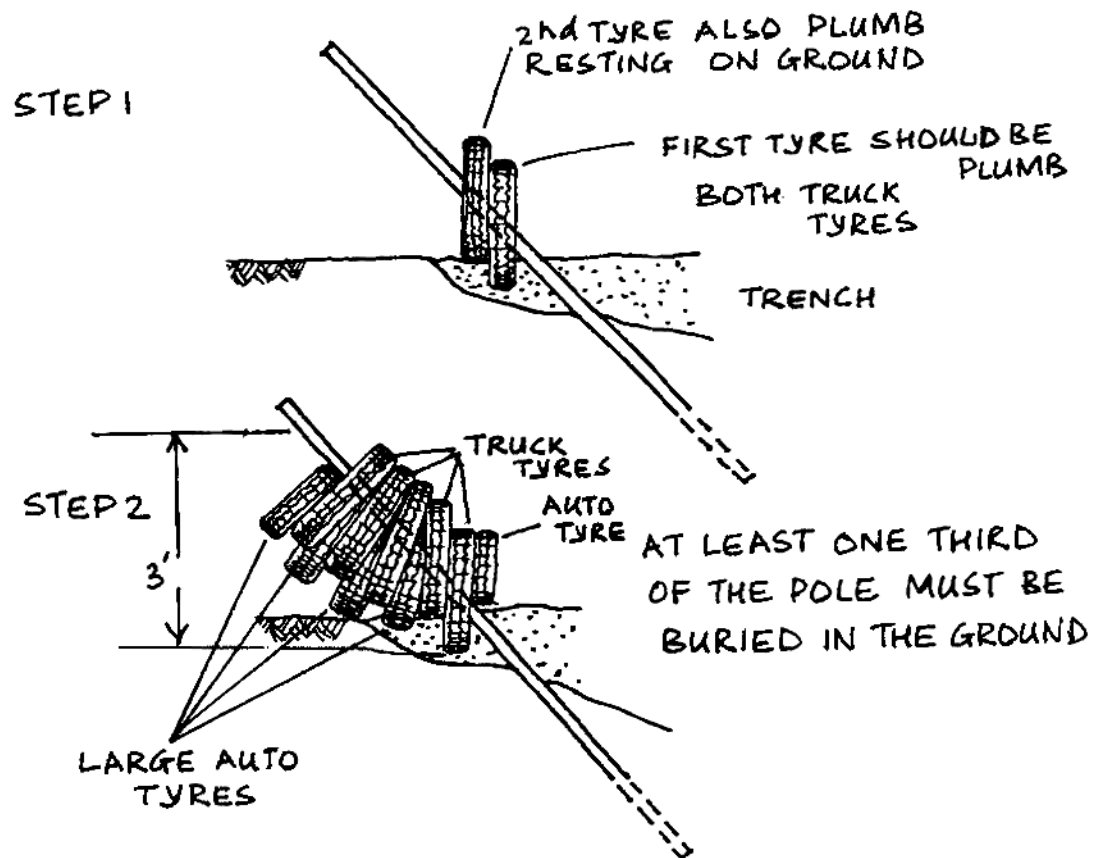
Fantasy  
**Tire Dragon**

**Materials**

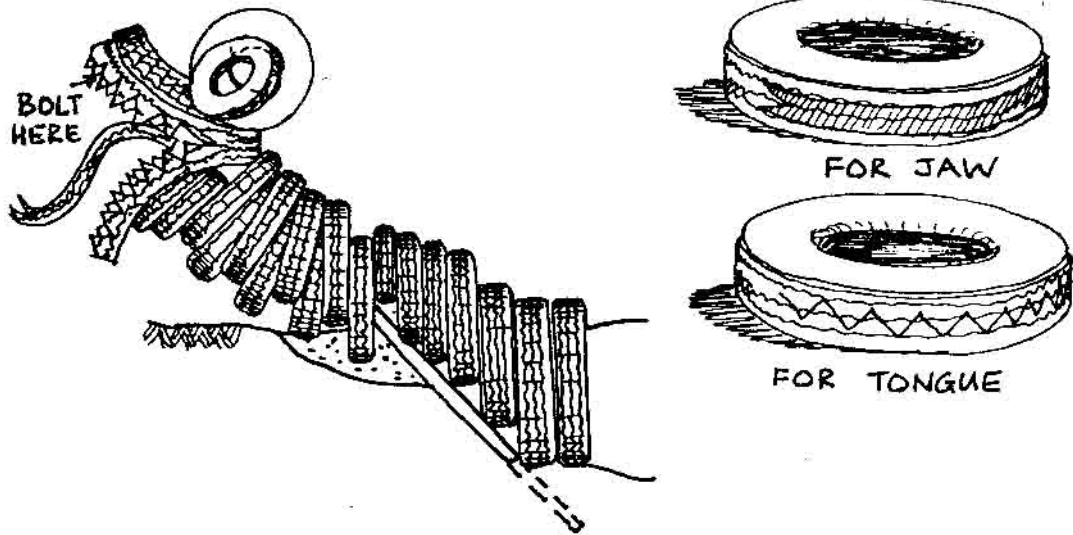
- 1 – 6" Diameter x 12' Pole
- 8 – Tractor Tires
- 16 – Truck tires
- 3 – 4 Small Auto Tires
- 18 – 3/8" x 3" Lag Bolts
- 18 – 3/8" x 3" Washers
- 18 – 3/8" x 2" Standard Bolts
- 32 – 3/8" Standard Bolts
- 16 – 3/8" Nuts

**Tools**

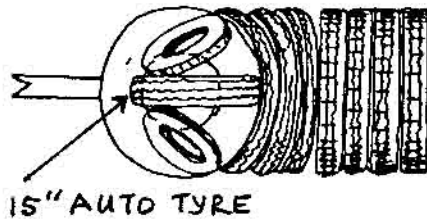
- Shovel
- Same as Tire Ladder
- Jigsaw or Sharp knife



## Tyre Dragon (continued)

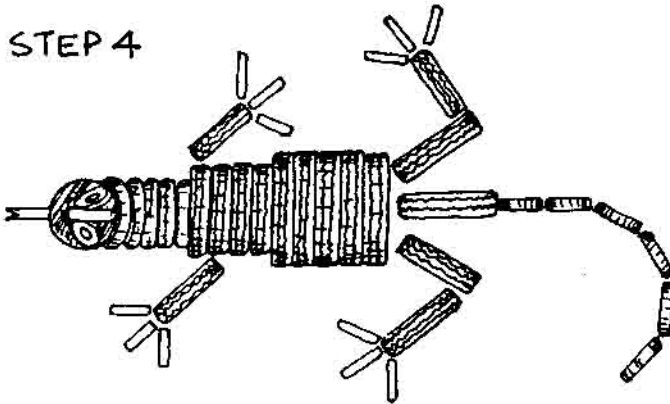


Lag eye tires at three (3) points of contact – small tires



### Note

Bolt Lower Jaw to tire below.  
Bolt tongue to pole and across lower opening of tire to close and bold extra strips to close.  
Paint with enamel paint as desired



Finish body and legs with Tractor + Truck Tires.

Movement Climbing  
**Flying Fox**

**Materials**

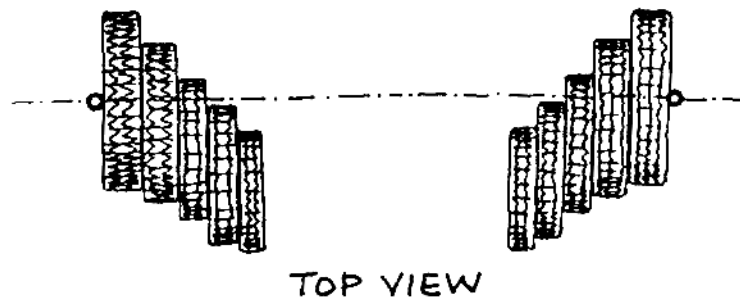
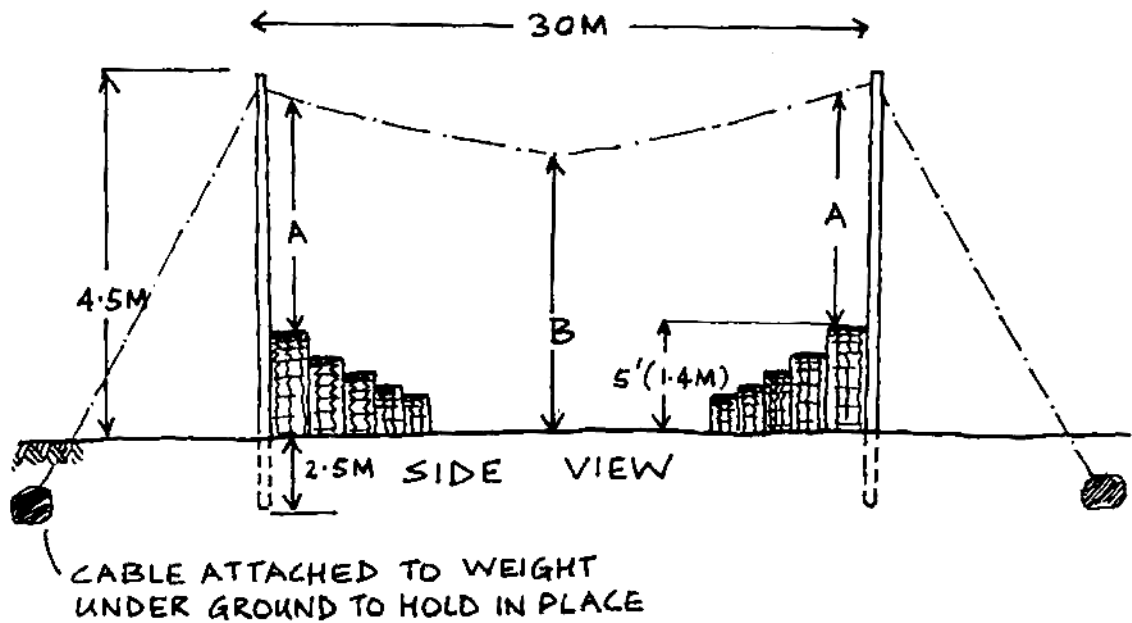
- 20 Poles 21 ft. (7M) or longer
- 40 M, 3/8" Fibre Cord Flexible Steel Cable
- 8, 3/8" "U" Bolt Cable Clamps
- 1, Pulley Assembly
- 1, Handle

**Tools**

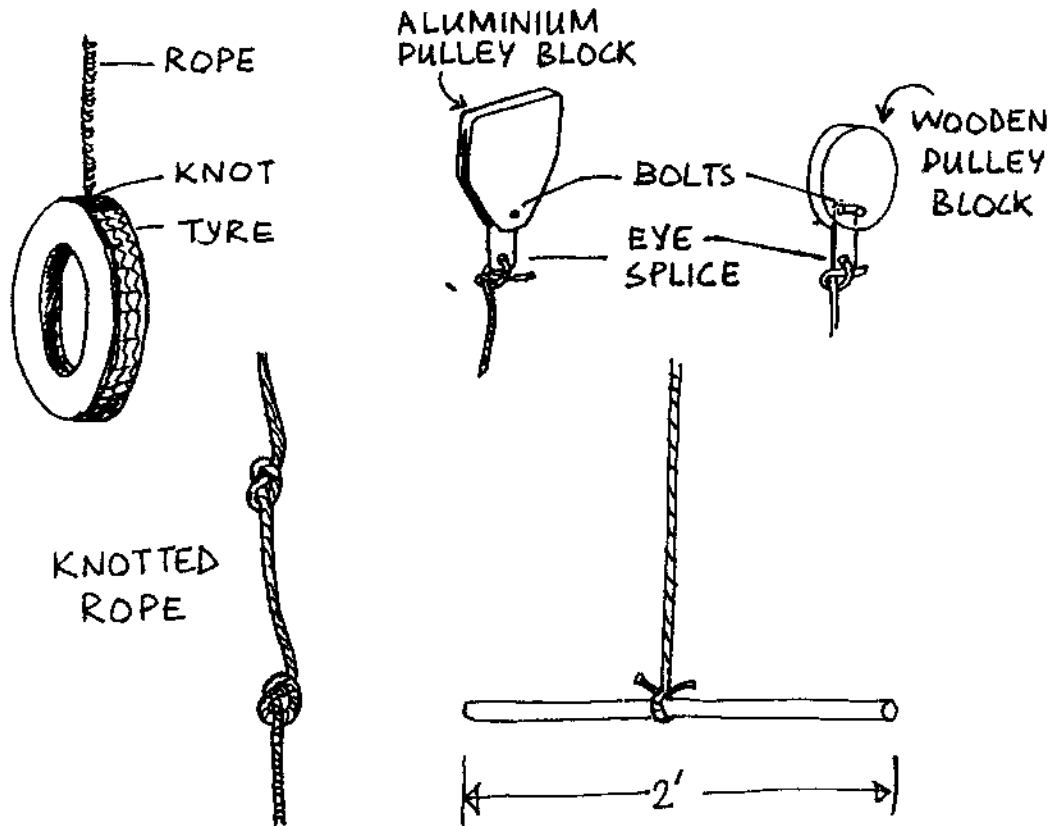
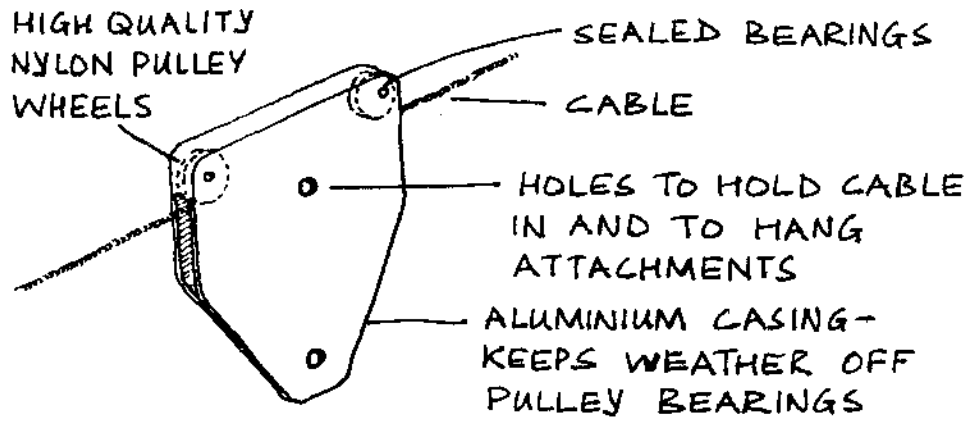
- Shovel, 9/16" Spanners.

**Note**

Distance "B" is the same as "A" plus 18".



## Flying Fox (continued)





Movement Group  
**Tire Flipper**

**Materials**

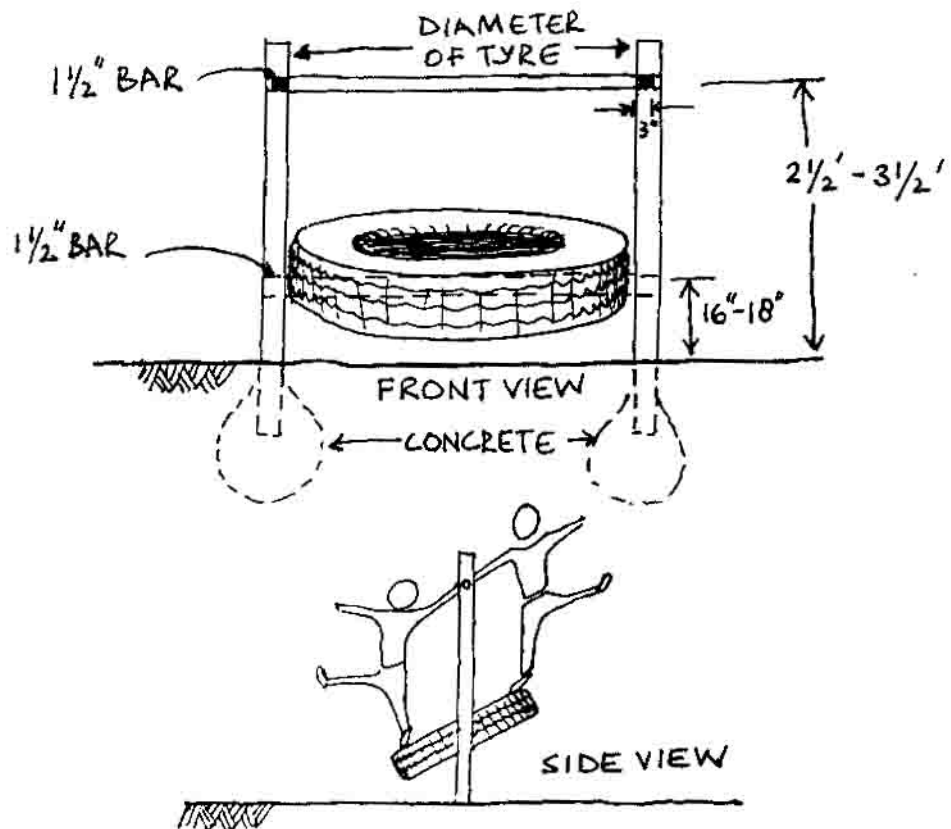
- 1 – Large Truck Tire
- 2 – 1½" outside diameter Bars
- 2 – 4" x 6" x 6" Posts

**Tools**

- Electric Drill with 1½" wood bore Bit
- Sharp Knife
- Shovel

**Note**

Length of bar is diameter of tire plus 6" (3" on each post).



**Note**

Use tire that still has a fair amount of tread left to add stiffness to tire.

## **See Saw**

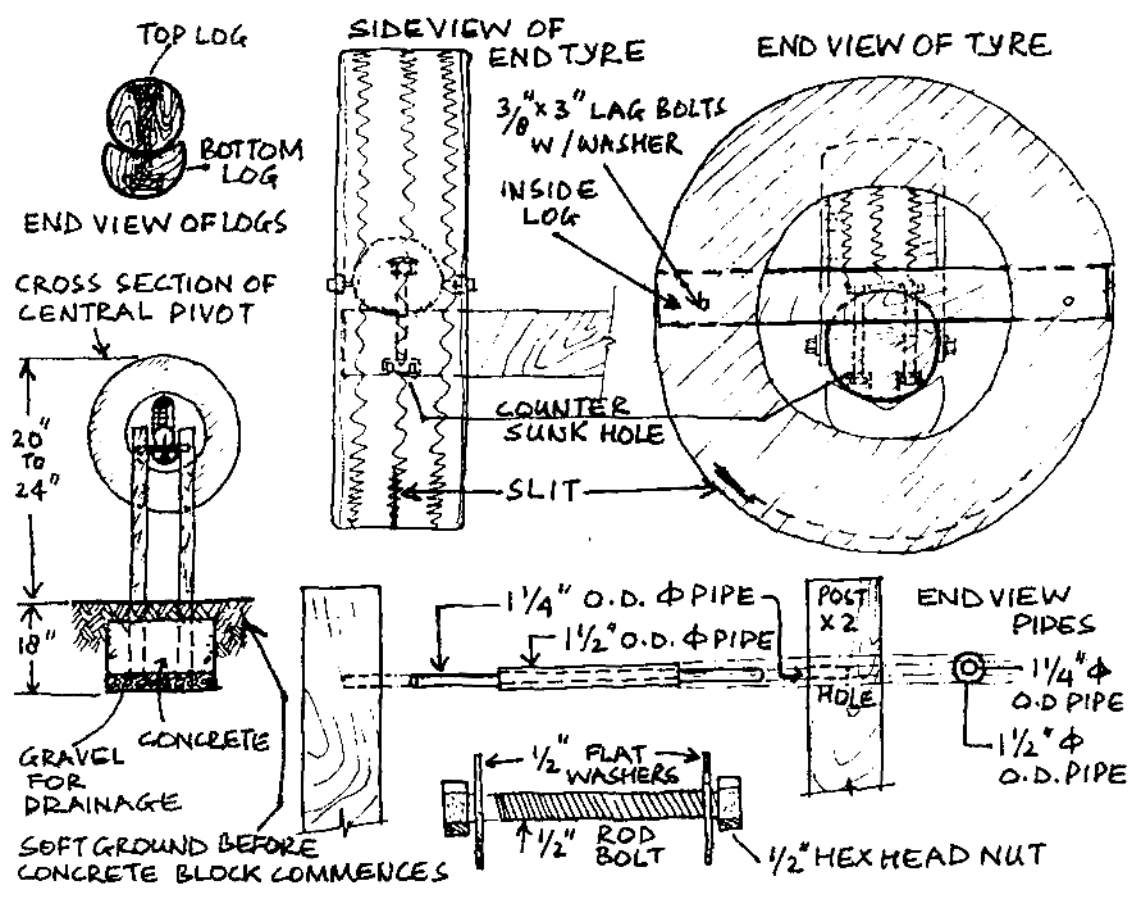
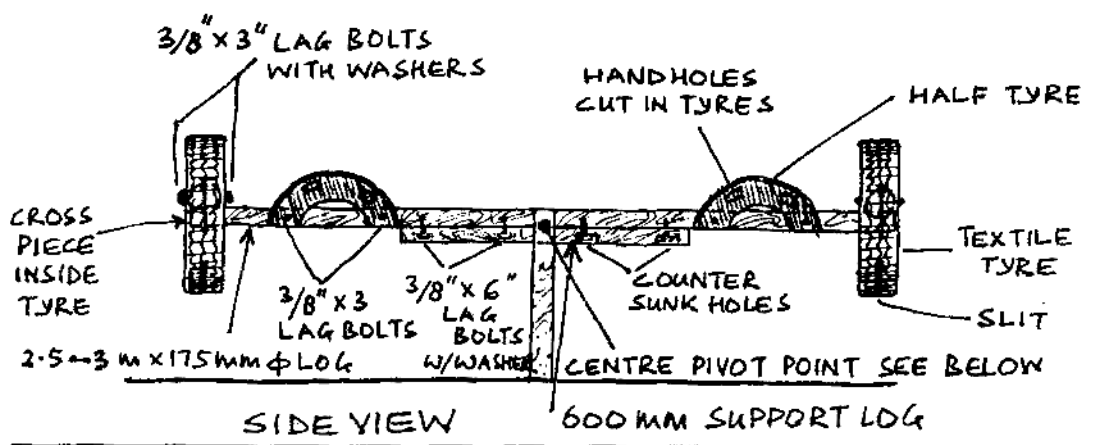
### **Materials**

3 – Textile tires  
4 – 3/8" x 6" Hex head Lag Bolts  
16 – 3/8" x 3" Hex head Lag Bolts  
20 – 3/8" Flat Washers  
2 – 3 M treated logs 175 MM (6")  
1 – 1M x 1/2" all thread rod Bolt  
8 – 1/2" Hex head Nuts  
8 – 1/2" Flat Washers  
1 – 6" x 1 1/2" O.D diameter Galvanised pipe  
1 – 11" x 1 1/4" O.D diameter Galvanised pipe  
3 – 5 bags ready mix concrete  
Gravel or sand for drainage at bottom of hole.

### **Notes**

1. This seesaw must be assembled prior to placing in the ground, as there are no bolts showing through on the support logs.
2. Use a short section of rope to tie log support posts together until concrete is set.
3. Slit in bottom of tires should be large enough just to get the log into tire.
4. Bolt end logs together before securing tires with log bolts.

**See Saw (continued)**



## Movement Bumper Car

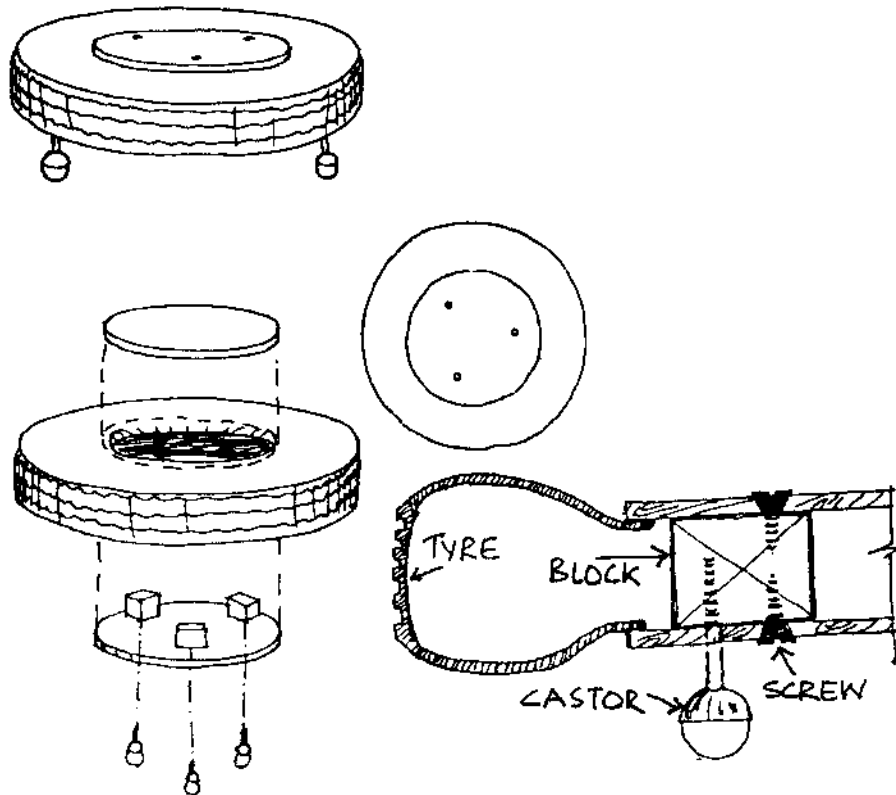
### Materials

- ½ “ Exterior plywood cut into two pieces with 300 mm diameter
- 3 – Hardwood blocks 60mm x 60mm-x 40mm castor
- 3 – Castors
- 6 – No. 10 Counter sunk wood, screws 35 mm long, Galvanised
- 1 – Car tire 5.20/12 (to fit above woodcuts - larger can be used but wood sizes would need adjusting accordingly!)

1. Drill countersink holes on ½” wooden disks at 120 degree intervals on a 250 mm diameter (Blocks should fit against inside rim of tire)
2. Attach block with screws towards inside.
3. Drill and attach castors to outside of blocks without splitting.

### Tools

Drill + Bit for screws and countersinks  
Screwdriver



### Note

It is important that screws are flush and castors are of good quality.

Fantasy Landscape  
Hill-Mixed Materials

MATERIALS:  
 TRUCK AND CAR TYRES  
 LOGS OF VARYING LENGTHS  
 LARGE ROCKS  
 1, 3/8" x 2' ROD BOLT  
 4, 3/8" NUTS  
 4, 3/8" WASHERS

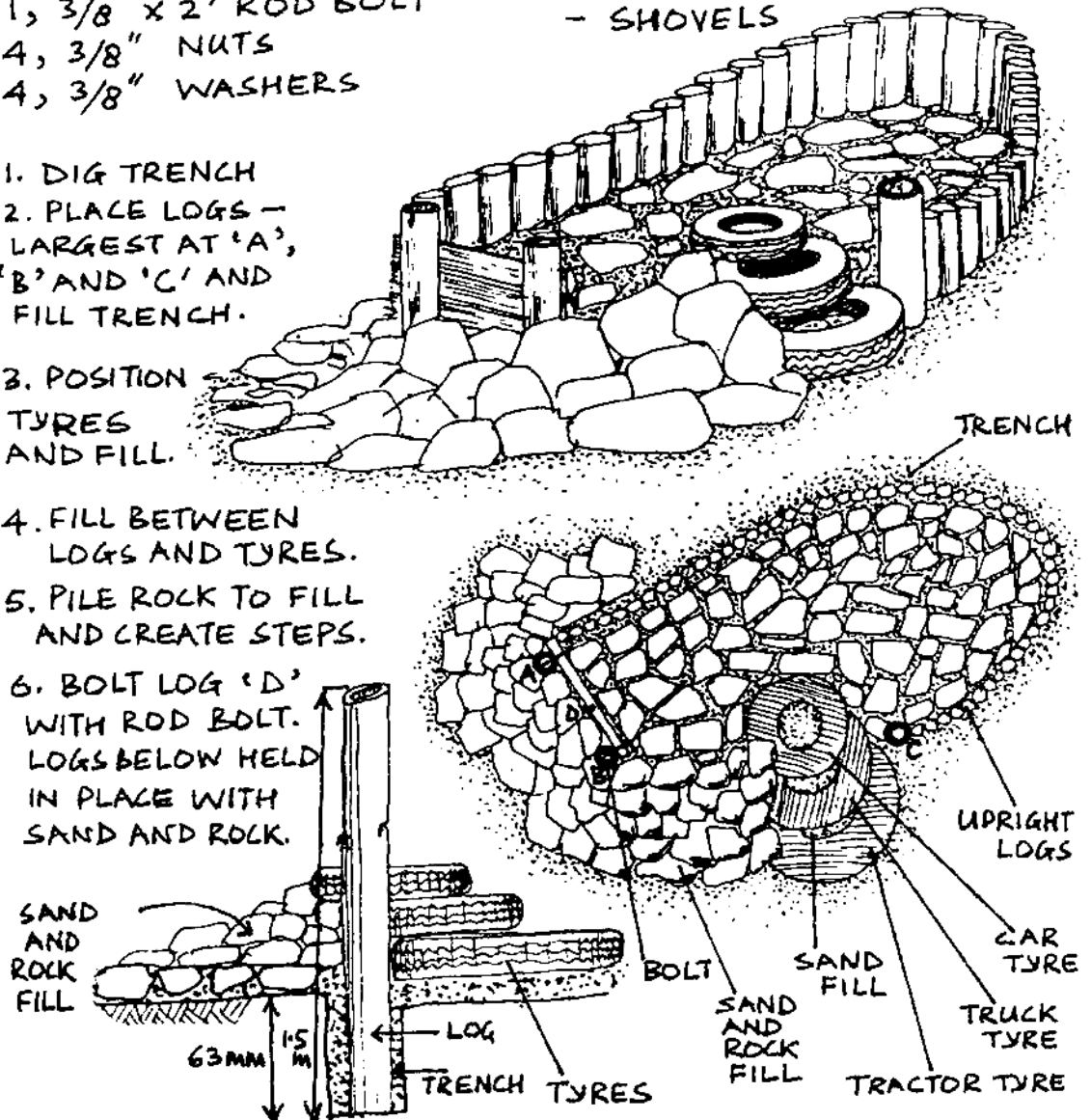
TOOLS:  
 BRACE + BIT  
 - LONG 3/8" BIT FOR  
 DRILLING LOG  
 - SHOVELS

1. DIG TRENCH
2. PLACE LOGS - LARGEST AT 'A', 'B' AND 'C' AND FILL TRENCH.

3. POSITION TYRES AND FILL.

4. FILL BETWEEN LOGS AND TYRES.
5. PILE ROCK TO FILL AND CREATE STEPS.

6. BOLT LOG 'D' WITH ROD BOLT. LOGS BELOW HELD IN PLACE WITH SAND AND ROCK.



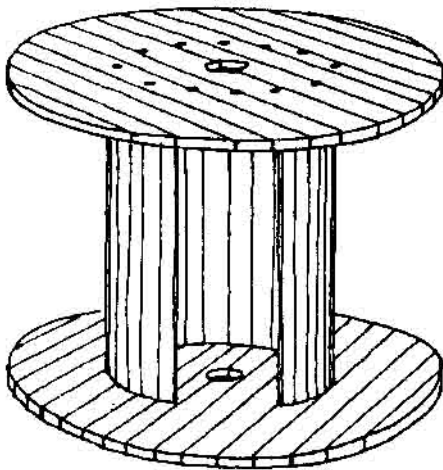
Dramatic Solitary  
**Cable Spool House**

**Materials**

Wooden Cable Spool (large one that bulk wire comes on)  
Nails 8 – 10.

**Tools**

Saw  
Hammer  
Spanners (2) to fit bolts in spool



**Important**

Remove slats between two of the rod bolts running along the length of the spool.

**Note**

With saw remove 4 or 5 of the wooden slats from the centre of the spool and secure end slats with nails  
(maybe necessary to tighten bolts running through spool to add strength).  
Depending on size of spool, one or two children can hide inside it.

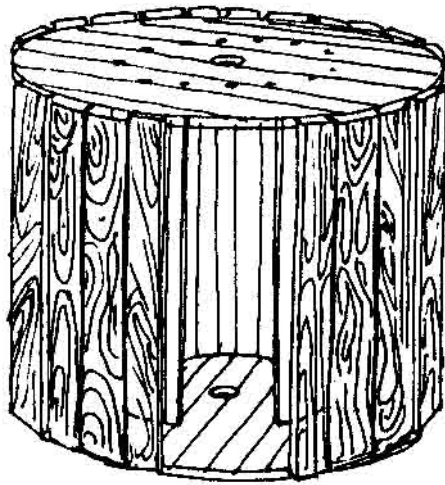
Fantasy  
**Cable Spool Maze**

**Materials**

Large cable spool nails  
4" x 2" wooden slats  
(Length depends on size of spool)

**Tools**

Saw  
Hammer  
Spanners (2) to fit bolts on spool



**Note**

Remove some slats from the inner circle – attach slats to outside rim around edge - leaving space between each (approx. 3") to create a circular maze.

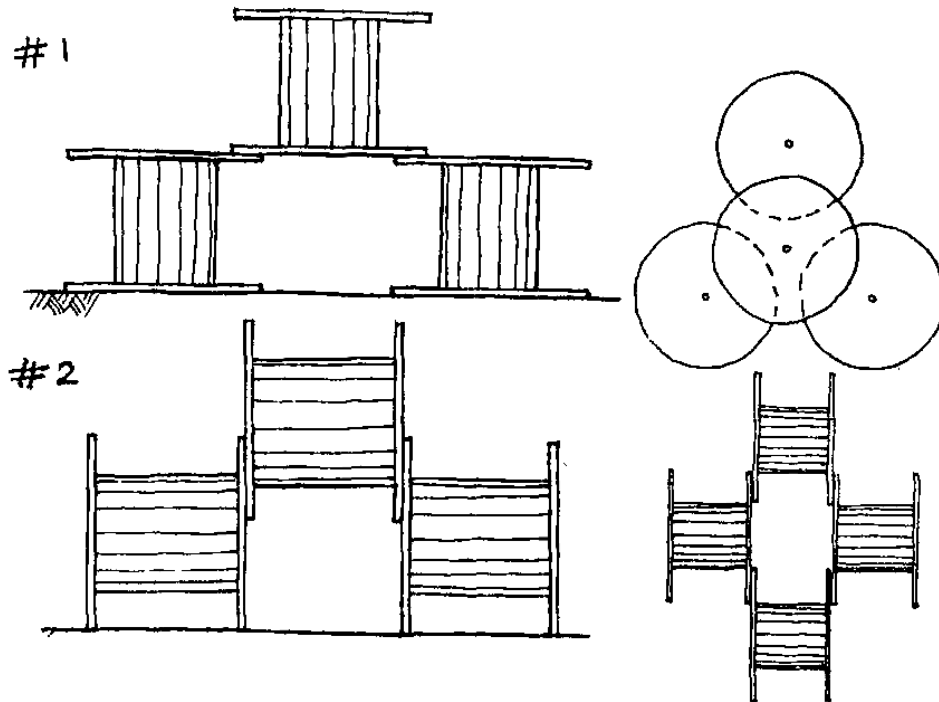
Climbing  
**Cable Spool Climber**

**Materials**

Wooden Cable spools of various sizes  
3/8" x 3" Standard Bolts  
3/8" x 3" Standard Bolts  
3/8" Nuts  
3/8" Washers

**Tools**

Brace + Bit  
3/8" Wood  
1 1/4" wood or electric drill with bits  
Spanner 9/16" (2)  
Hacksaw  
Hammers.



**Notes**

Almost any configuration can be made.  
Make sure to counter sink the bolts and cut off the excess bolts with hacksaw.  
Hammer end of bolt to "mushroom" and thus prevent nut from falling off.



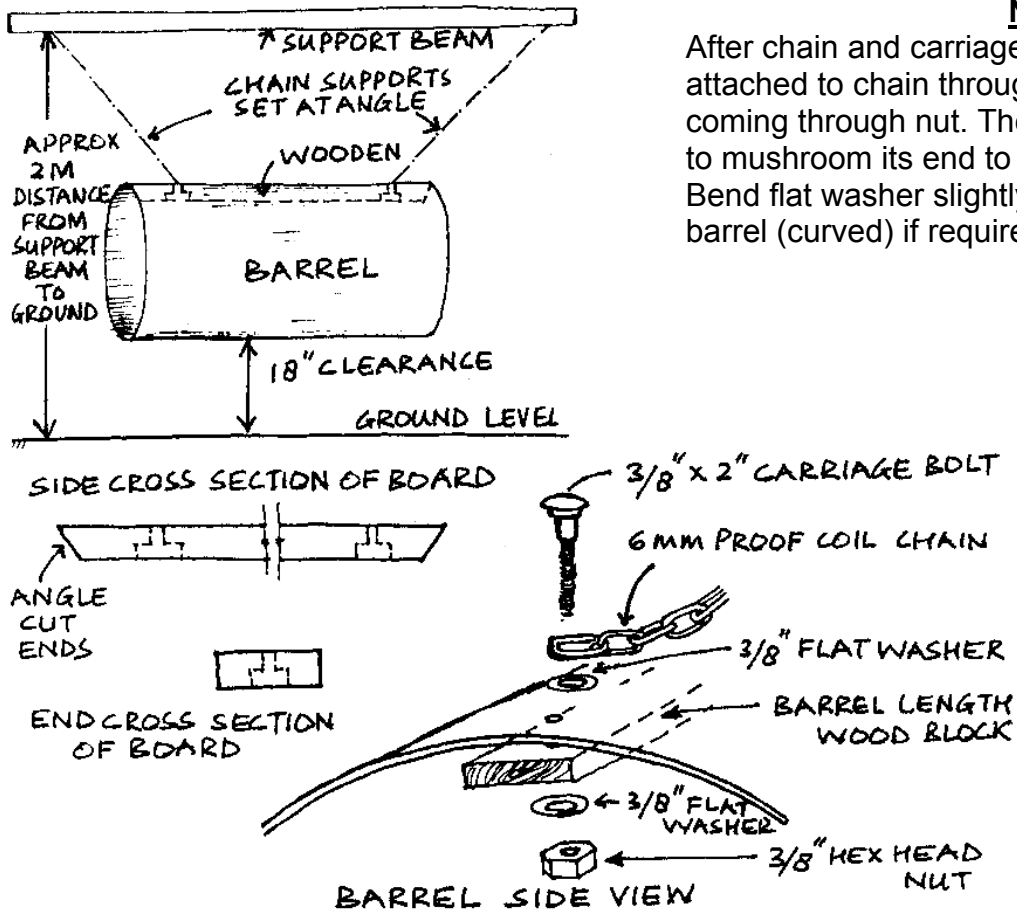
# Swinging Barrel Swing

## Materials

- 1 Heavy Gauge Steel Barrel with both ends open
- 2, 3/8" x 2 Carriage Bolts
- 2, 3/8" Hex Head Nuts
- 2, 3/8" Flat Washers
- 1, 6 mm Proof Coil Chain (Zinc or Galvanised)

## Notes

After chain and carriage bolt support is attached to chain through barrel cut excess coming through nut. Then pound bolt over to mushroom its end to prevent nut coming. Bend flat washer slightly to match shape of barrel (curved) if required.



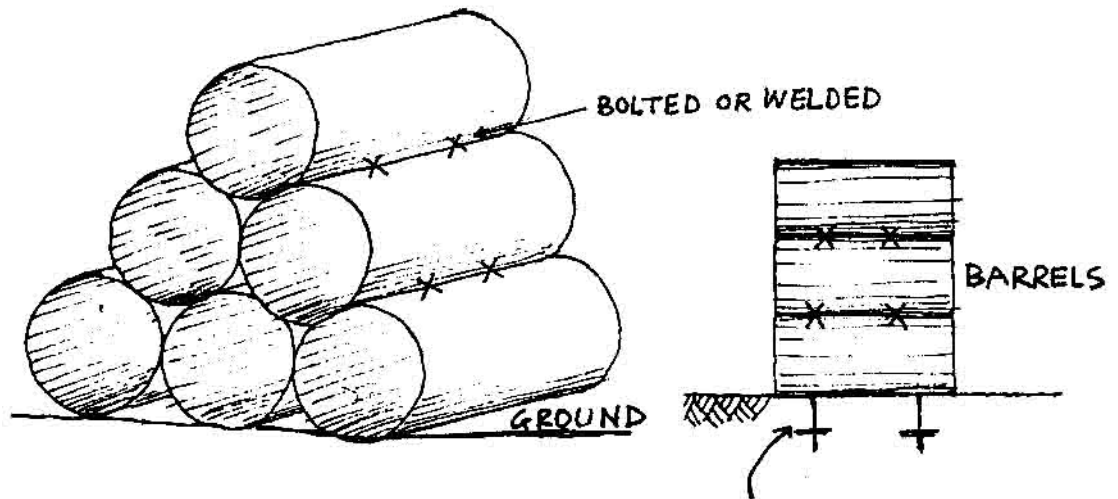
Climbing  
**Barrel Pyramid**

**Materials**

6 metal barrels

**Tools**

Welder  
Cold chisel  
Hammer  
Shovel



**Weld posts on to bury in ground**

**Step 1**

Cut ends from barrels and smoothen the edges.  
Lay edges on hard flat surface and hammer any sharp or rough edges smooth.

**Step 2**

Weld barrels together in above configuration at edges and at both ends  
and weld anchors onto bottom barrels  
to bury underground to stabilise structure.

**Step 3**

Paint with rust proof paint

Climbing  
**Barrel Maze**

**Materials**

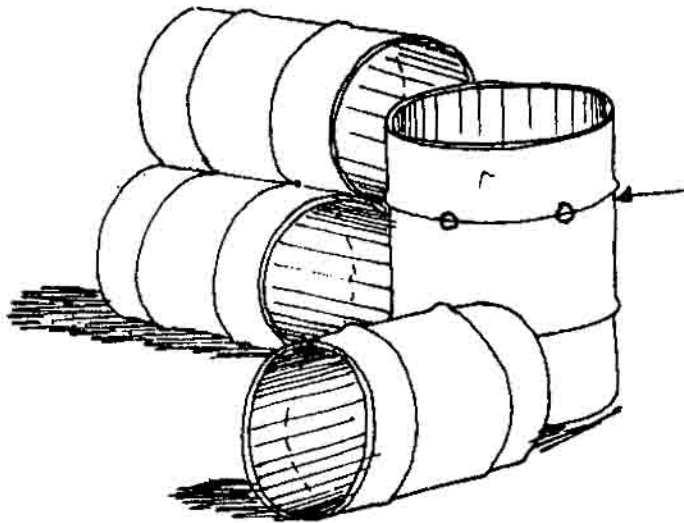
Barrels (Metal)

**Tools**

Hammer

Cold Chisel

Welder



Fill with sand and cut in  
drain holes to raise floor

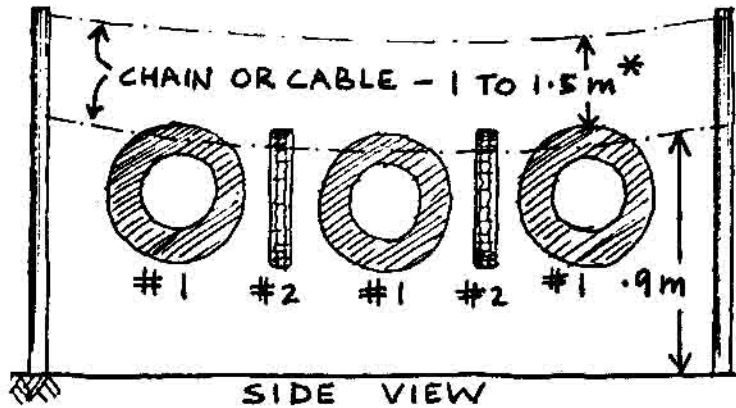
**Notes**

Weld barrels in place or attach "legs" to stabilise in ground.

Use boards and ladders to make other connections.

Use as many or as few barrels as you want.

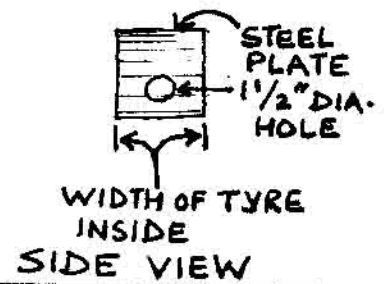
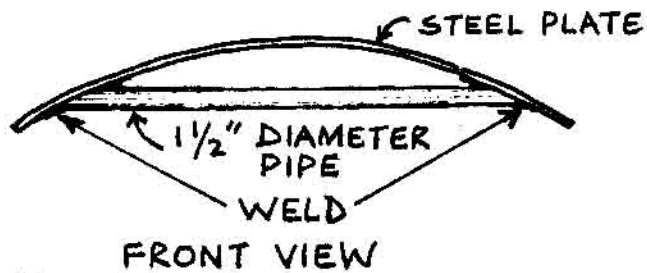
Climbing  
Tire Balance



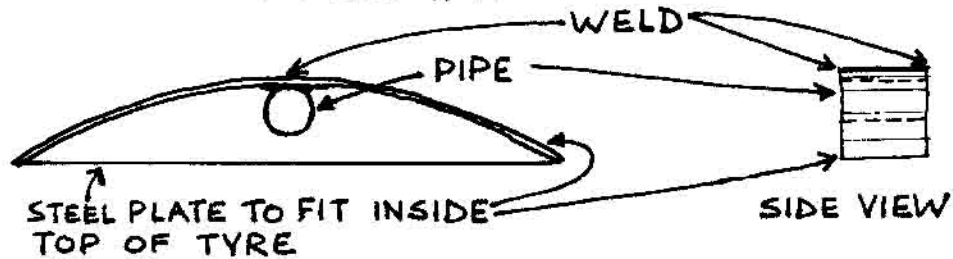
- TYRE INSERTS
- TO STRENGTHEN AND REINFORCE
  - TO REDUCE WEAR AND TEAR

\* HEIGHT DEPENDS ON AGE OF CHILDREN USING THE EQUIPMENT

INSERT # 1

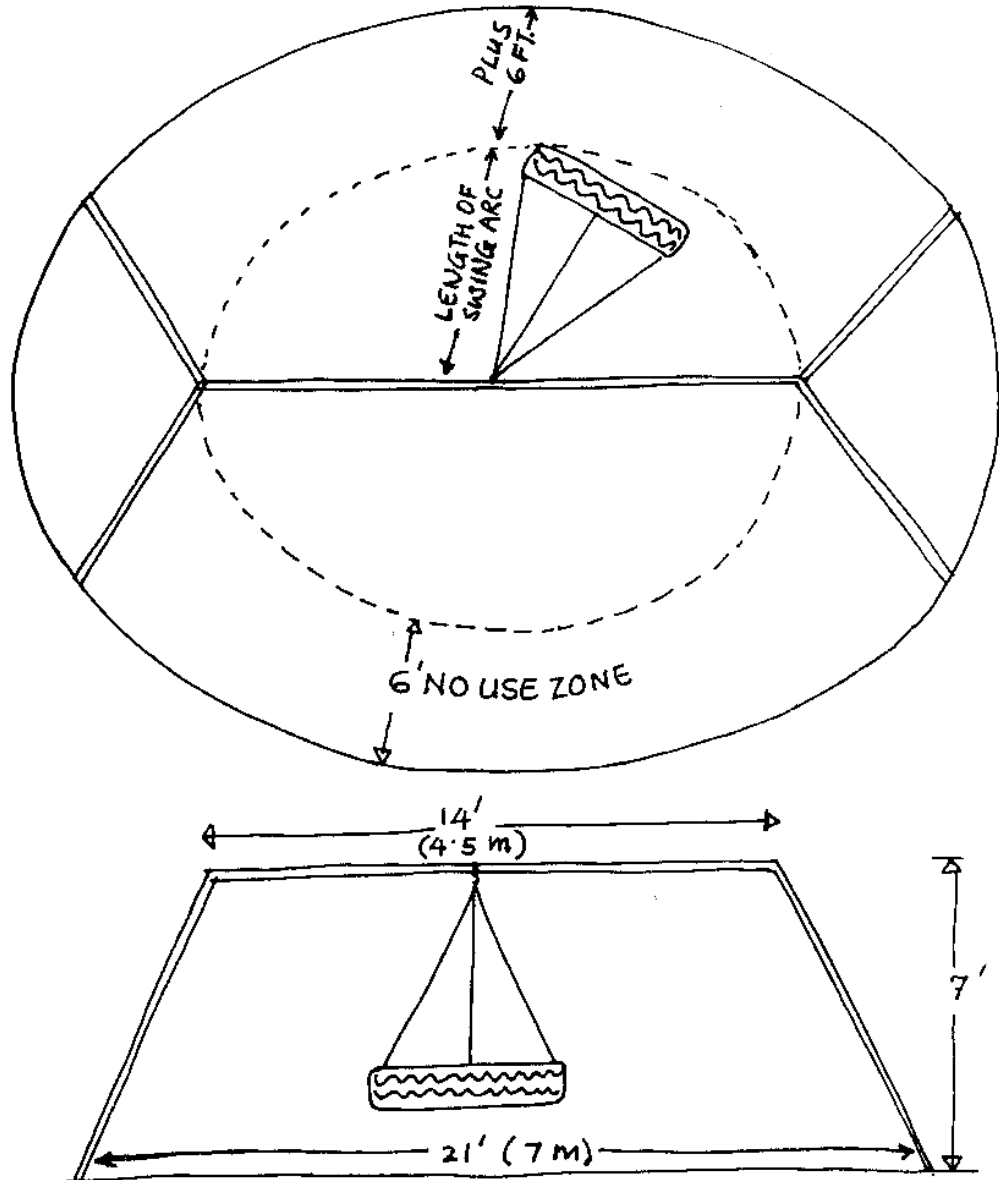


INSERT # 2



Front View

Swinging  
**Swivel Tire Swing**



**Note**

Length of swing arc plus 6 ft. with an apex point of 7 ft. generally gives a diameter of 21 ft. of clearing for swivel swing.

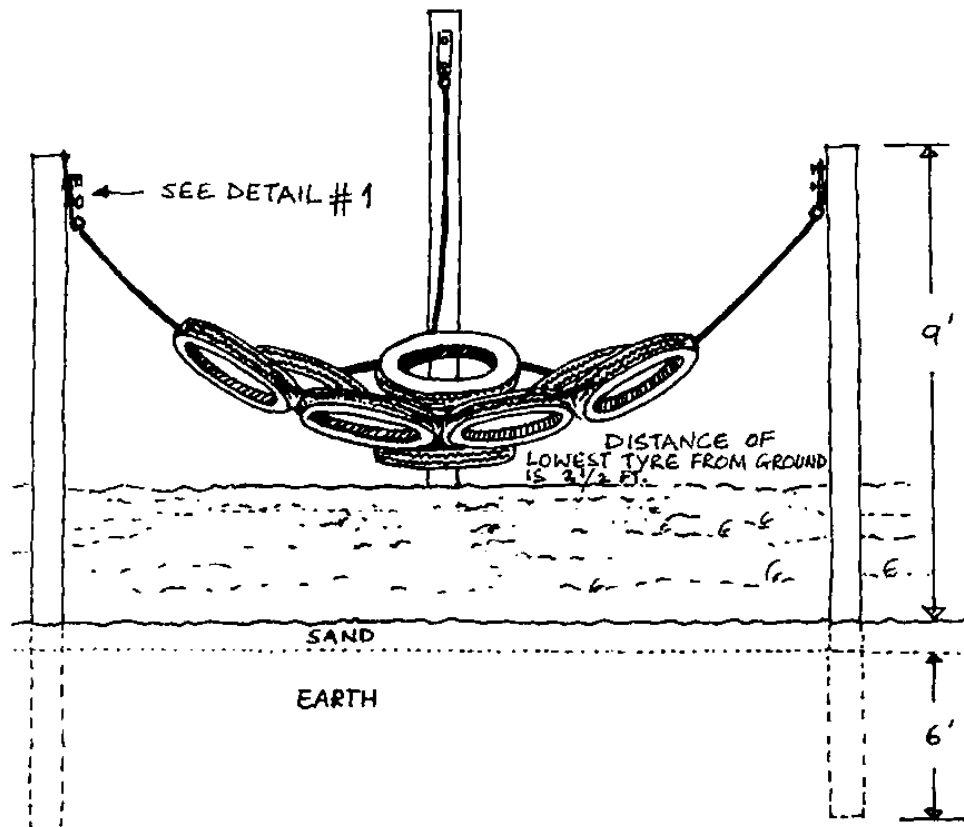
## Swinging, Fantasy Ten Tire Swing

### Materials

- 10 – large Auto Tires
  - 42 – 3/8" x 2 1/2" Standard Bolts
  - 42 – 3/8" Nuts
  - 6 – 3/8" Standard Washers
  - 72 – 3/8" x 3" Washers
  - 40 – 1/4" Proof Coil Chain
  - 40 – 1 1/2" Rubber Hose
  - 3 – 15' Wood or Steel Posts
  - 3 – Tire joint inserts
  - 3 – 4 Joint / Post mounts
  - 6 – 1/2" x 6" Lag Screws
  - 6 – 1/2" Washers
- Plus lots of concrete for posts

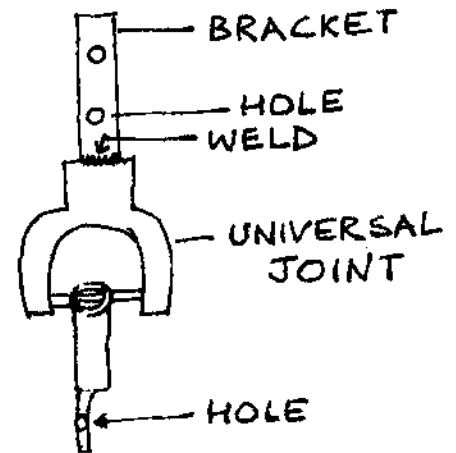
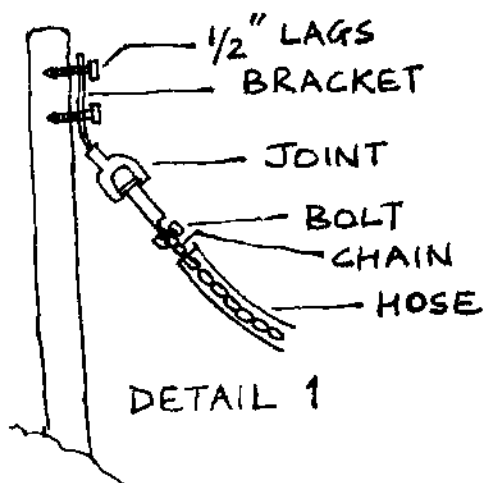
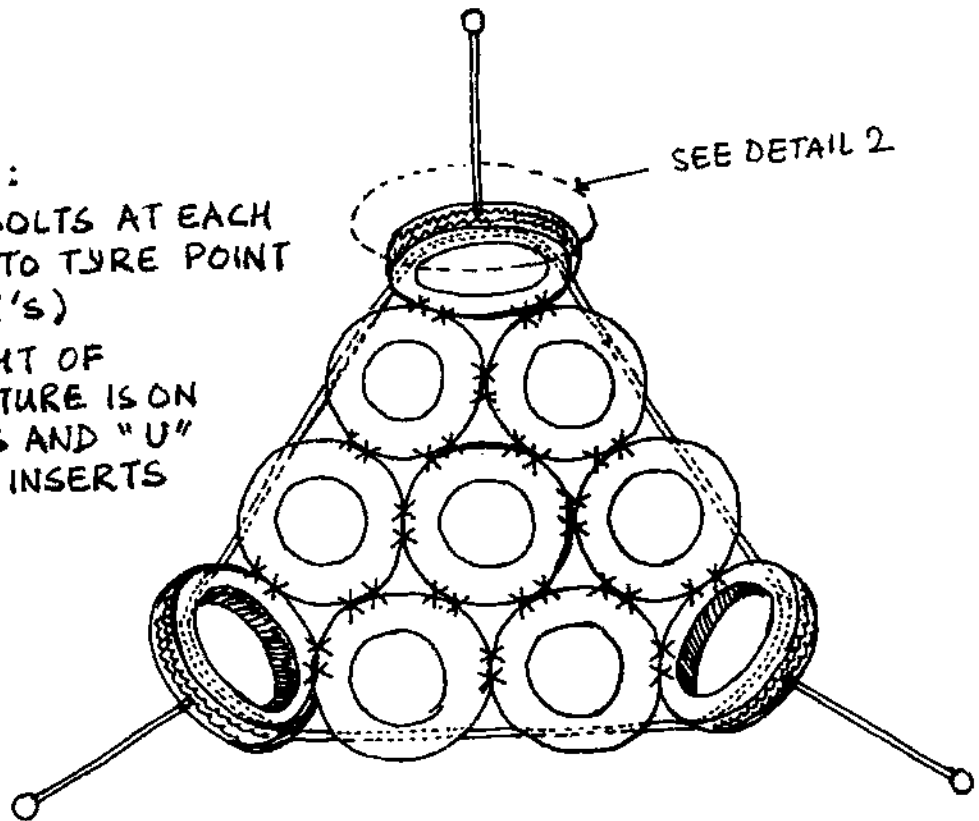
### Tools

- Electric drill with bit to size of Diameter of hose.
- 9/16" spanners + Ratchets and sockets
- Bolt cutters or hacksaw.
- Welder (if metal poles are used)
- Shovels.

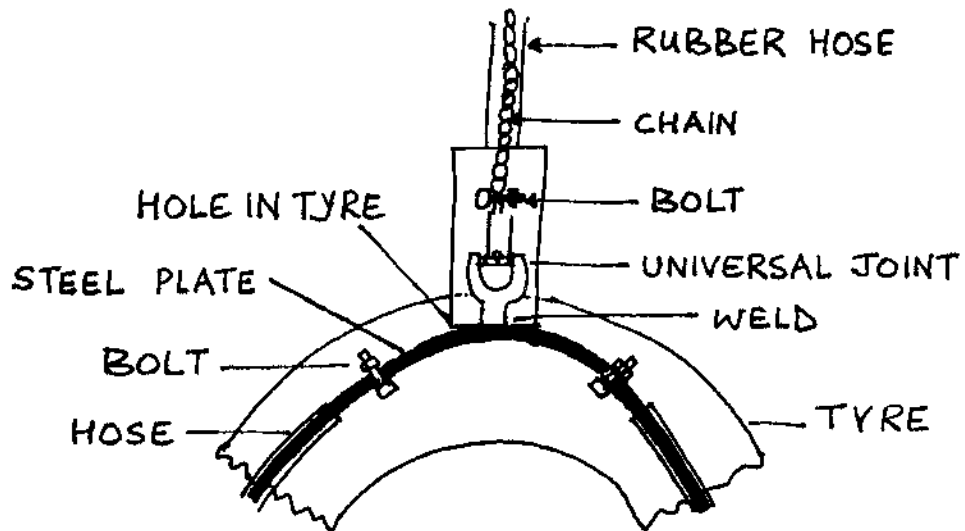


## Ten Tire Swing (continued)

NOTES :  
TWO BOLTS AT EACH  
TYRE TO TYRE POINT  
(AT X'S)  
WEIGHT OF  
STRUCTURE IS ON  
CHAINS AND "U"  
JOINT INSERTS



## Ten Tire Swing (continued)



### Step 1

Lay tires on ground and bolt together.

### Step 2

Cut holes in tires and tread to allow 'U' joints and size of chain with hose covering to pass through - Measure to fit from joint insert to insert and bolt.

### Step 3

Attach pole bracket joints to posts.

### Step 4

Cut three pieces of chain approx. 6 feet and cover with hose.

### Step 5

Lots of people lift and tamper with bolts.  
Adjust corners so that they are fairly level and centre tire is approx. 2 feet above the ground.

### Step 6

The universal tire joint should be covered with rubber tubing.



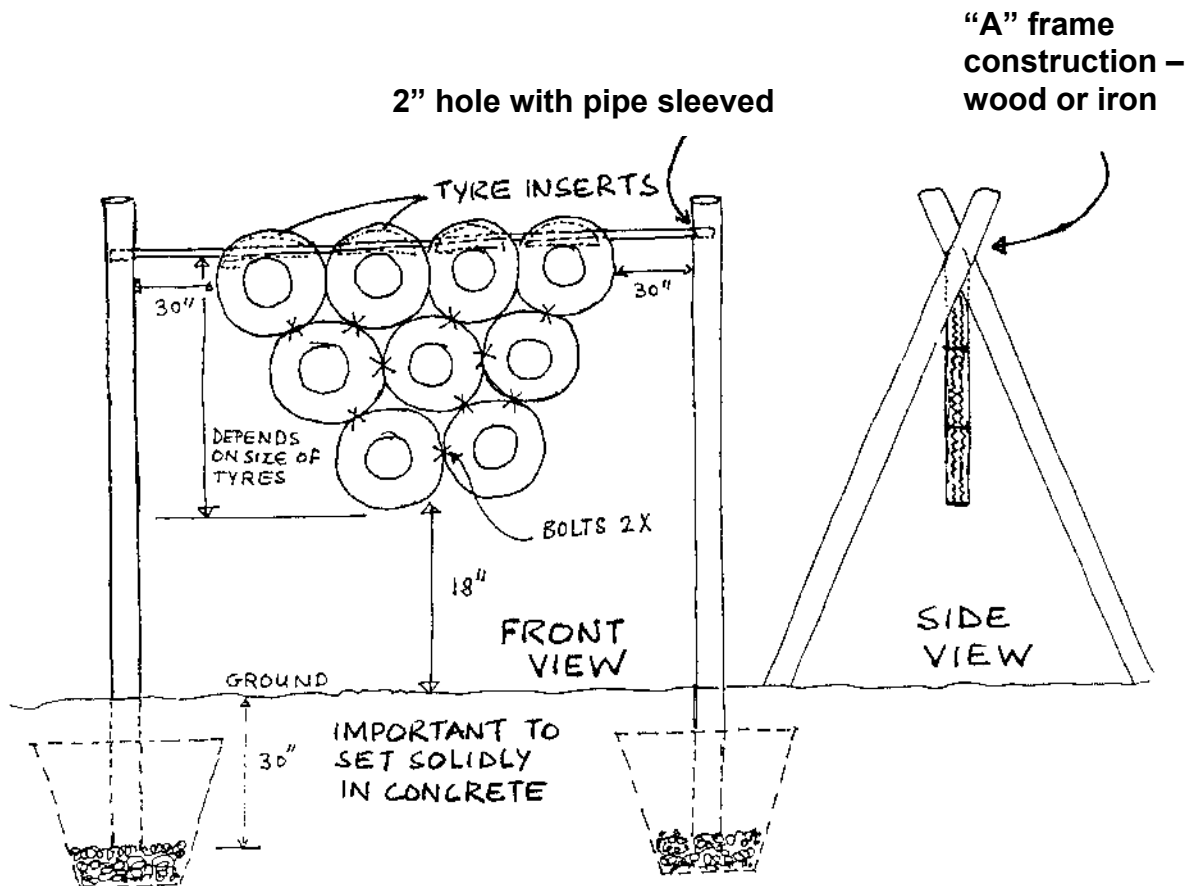
Climbing, Swinging  
**Swinging tire climb wall (Net)**

**Materials**

- AS drawn but can be made larger or smaller  
9 – Same Size firm auto tire  
3 – Length-wise tire inserts  
32 – 3/8" x 2 1/2" Standard Bolts  
32 – 3/8" x 3" Washers  
1 – 2" diameter x 12' steel bar (This bar needs to be strong and not flexible)  
4 – 6" Diameter x 15' posts  
2 – 1/2" All thread rod bolts  
4 – 1/2" Nuts  
4 – 1/2" Washers.

**Tools**

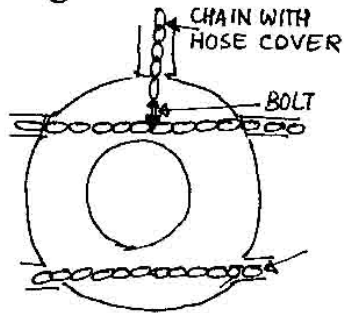
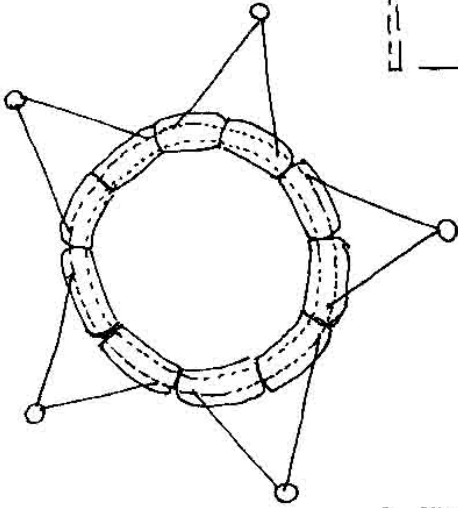
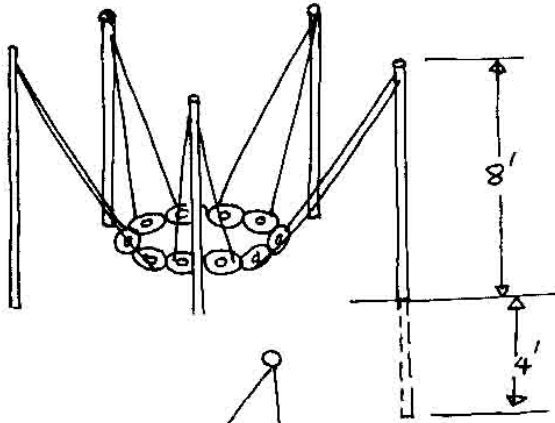
- Same as tire cube  
1/2" Electric Drill  
2" hole bit



**Gravel in bottom to aid in  
Drainage and stop termites.**

Swinging  
**Group Tire swing variations**

(On Ten tire swing)



**Circle**

Ten tires set in circle with five posts and chain coming down to each tire with chain running around circumference of tires.

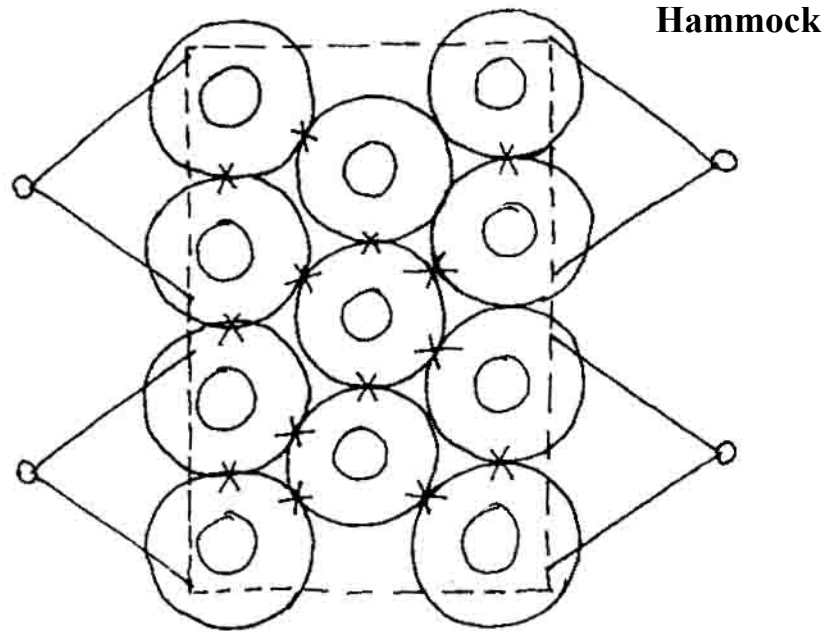
Bolt chain end to chain inside the tire.

Children sit in holes and the ring sways as the feet are pushed on the ground.

Distance from the ground is 12 inches.

Shorter lower chain to tilt tires in towards centre.

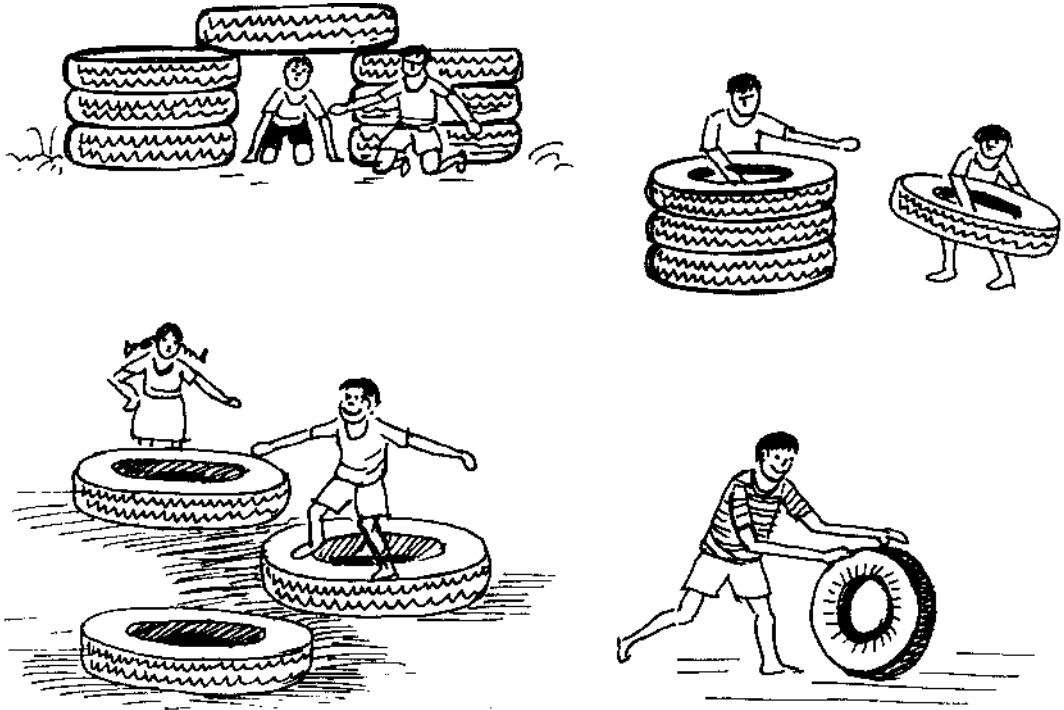
Swinging  
**Group Tire Swing Variations**



1. Eleven tires bolted together at each tire to tire touch point.
2. Covered chain around outside perimeter of "square" with same connection as above.
3. Children swing from end to end.
4. Distance from ground - 18 inches at centre point.

## Play with loose tires

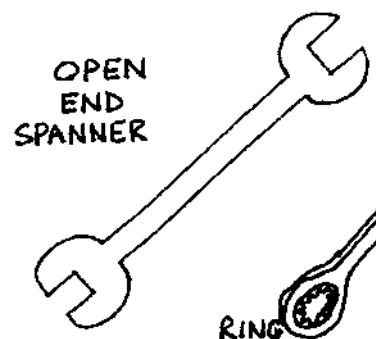
Tires are like modular building blocks. They could be simply stacked – one on top of the other to make a tower, or else they could be assembled into imaginative tire houses and tunnels. Children could always roll tires and jump on them.



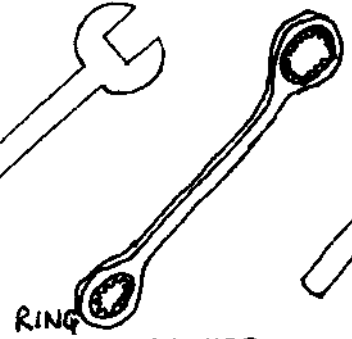
## Appendix

**Tools**  
**Tools & Hardware**  
**Bolt Connections**  
**Swing Dimensions**  
**Swivel Tire Swing Assembly**  
**Sand in Playgrounds**  
**IPA (International Play Association)**  
**Address of Resource Persons**

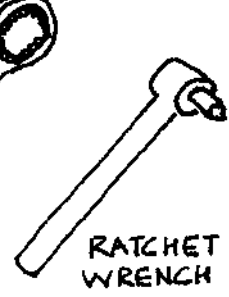
# TOOLS



OPEN  
END  
SPANNER



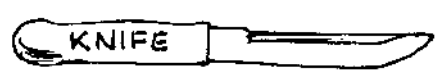
RING  
OR BOX SPANNER



RATCHET  
WRENCH



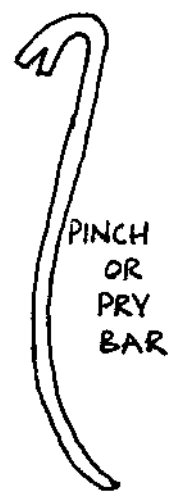
ALL SOCKETS  
SHOULD FIT  
AVAILABLE  
BOLTS & NUTS  
AND RATCHET



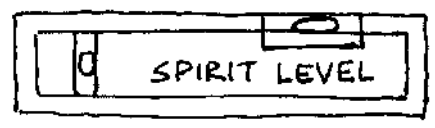
KNIFE



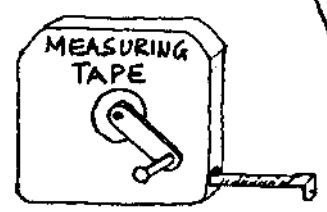
HAMMER



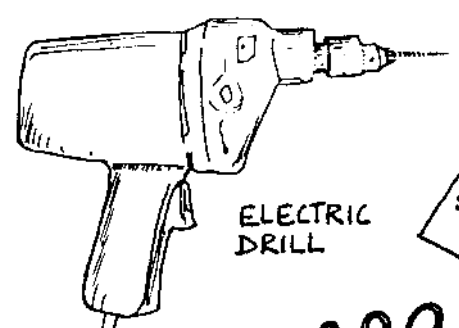
PINCH  
OR  
PRY  
BAR



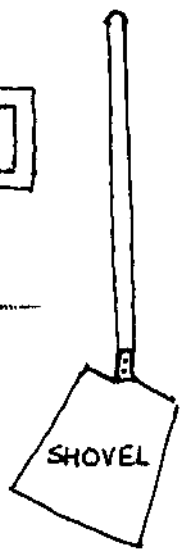
SPIRIT LEVEL



MEASURING  
TAPE



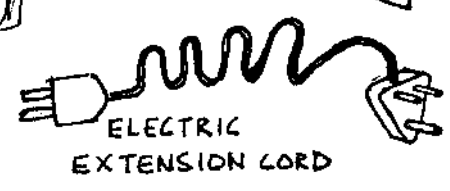
ELECTRIC  
DRILL



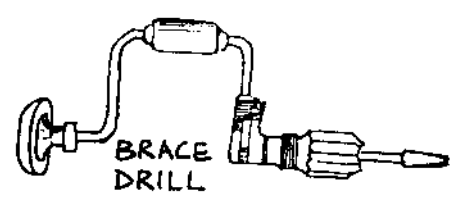
SHOVEL



SHARPENING  
STONE

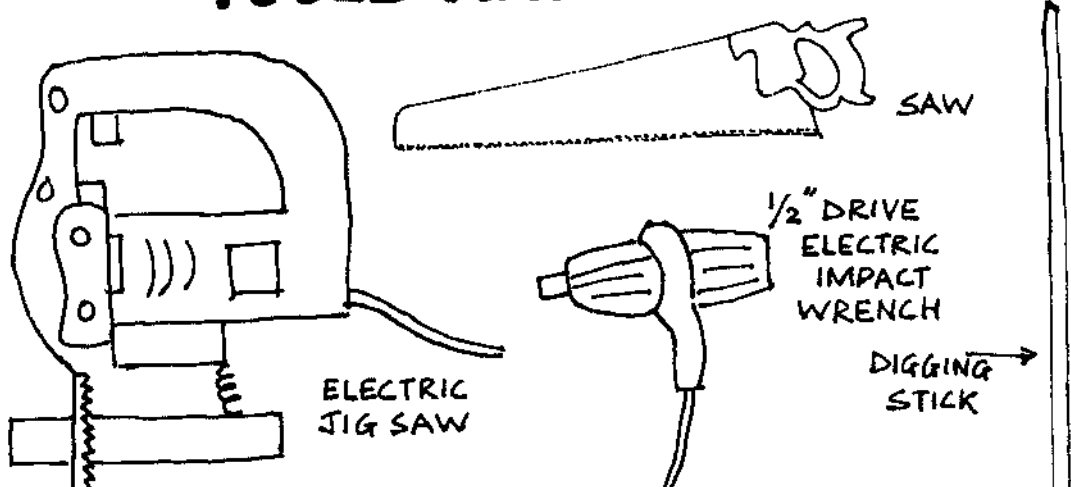


ELECTRIC  
EXTENSION CORD

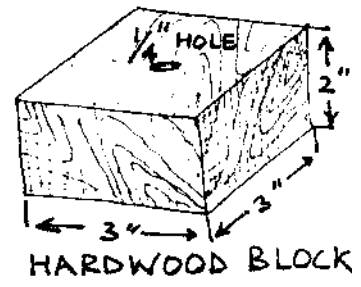
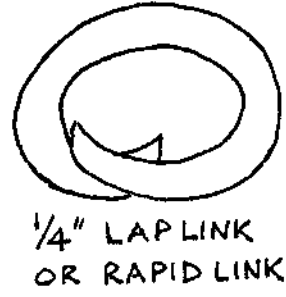
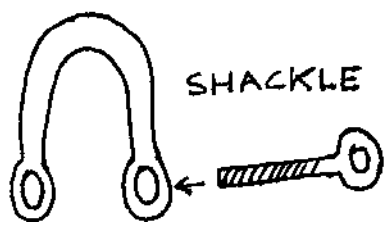
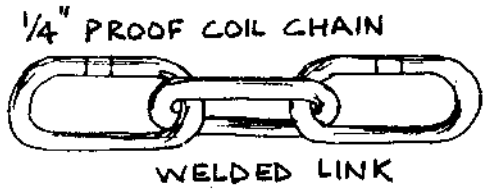
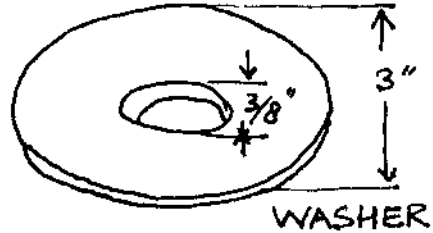
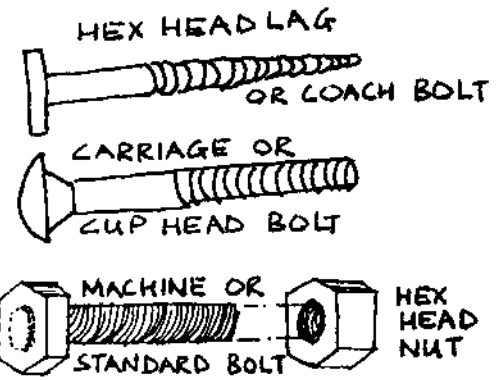


BRACE  
DRILL

# TOOLS AND HARDWARE

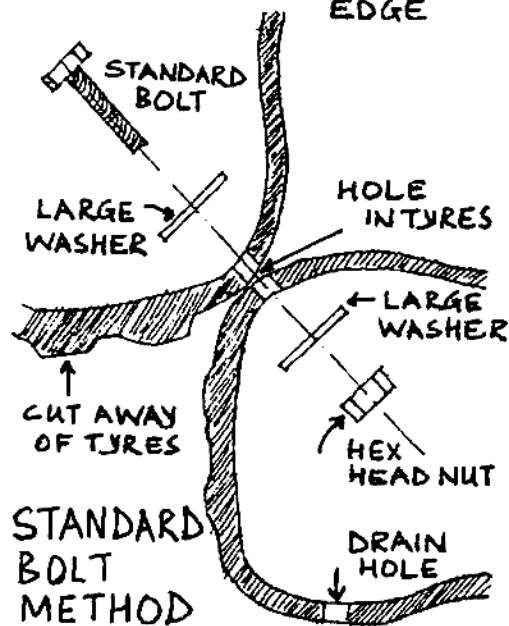


DIGGING STICK →

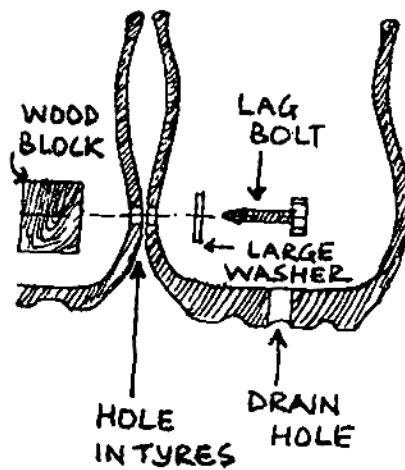
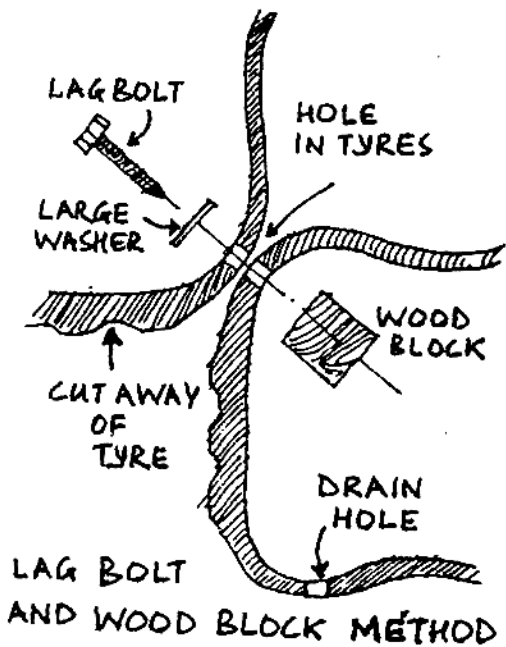
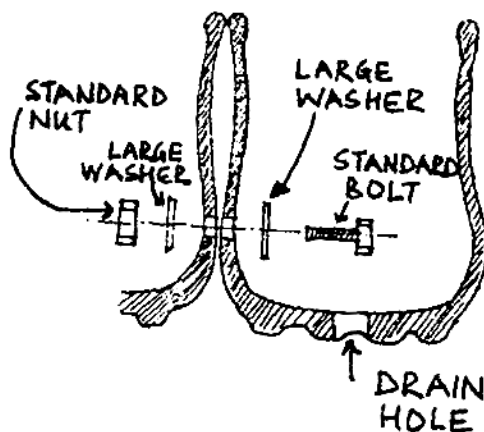


TYRE TO TYRE - 90°,  
CORNER OR EDGE TO  
EDGE

# BOLT CONNECTIONS

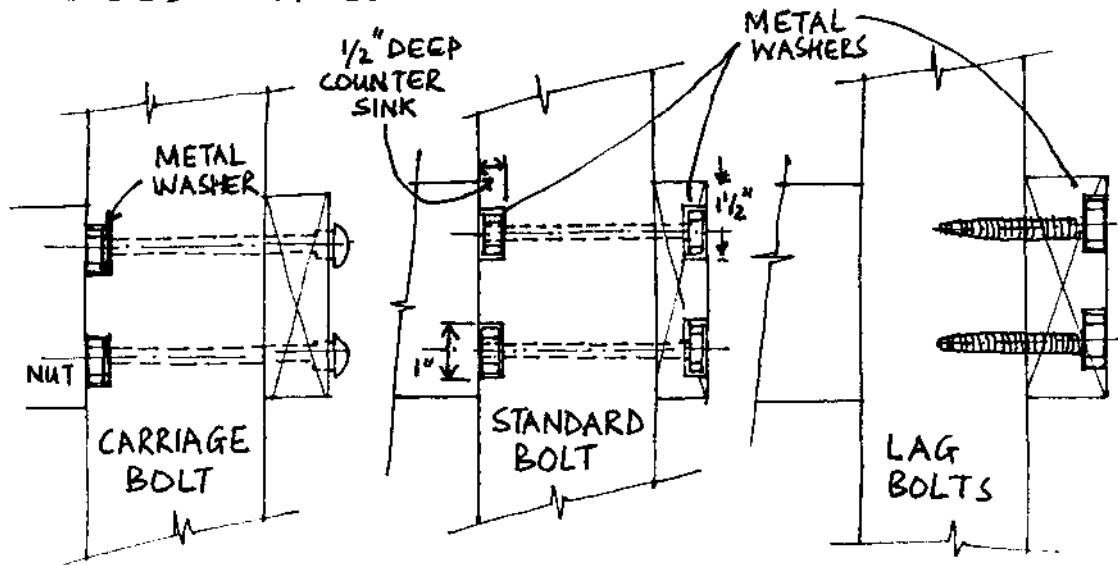


SIDEWALL TO SIDEWALL  
TREAD TO TREAD OR  
SIDEWALL TO TREAD

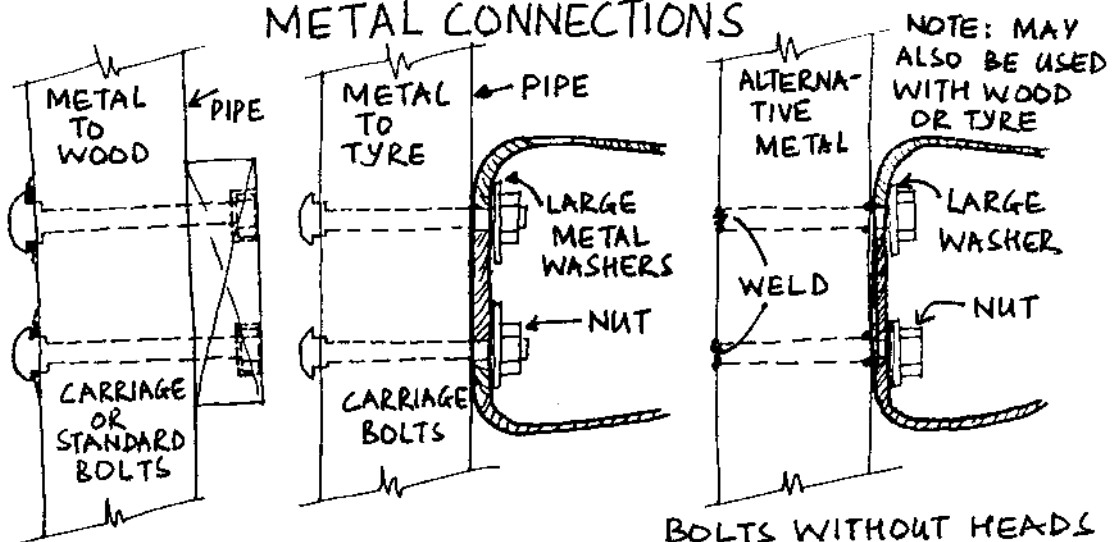


# BOLT CONNECTIONS

## WOOD TO WOOD CONNECTIONS



## METAL CONNECTIONS

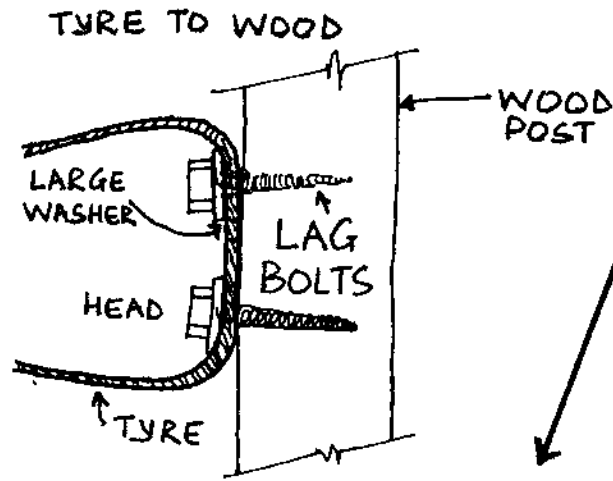


IMPORTANT NOTE: ALL WOOD CONNECTIONS IN DRAWINGS CAN BE REPLACED BY METAL POST CONNECTIONS SHOWN ABOVE

- BOLTS WITHOUT HEADS
1. DRILL HOLES IN METAL POST.
  2. TAP WELD THREADED BOLTS INTO HOLES ON BOTH SIDES.
  3. FILE SMOOTH



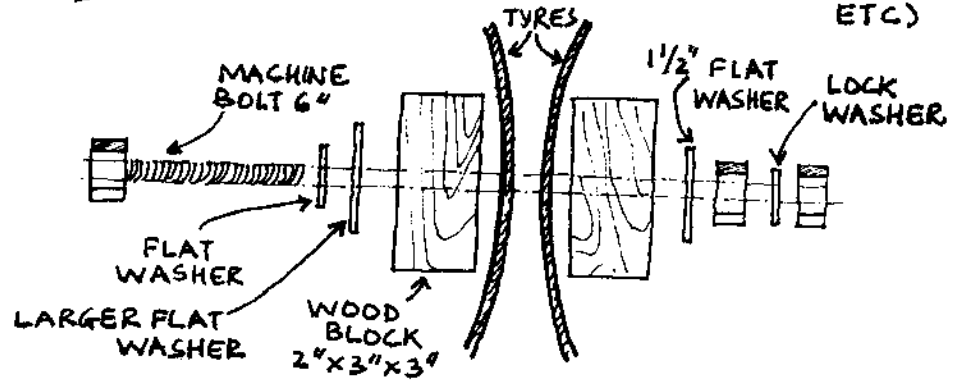
# BOLT CONNECTIONS



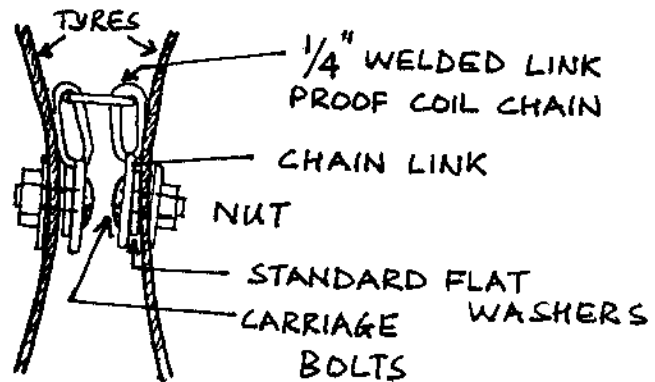
NOTE: USE IF LARGE METAL WASHERS NOT AVAILABLE

- USE HARDWOOD
- SOAK IN SUMP OIL PRIOR TO USE

ALTERNATIVE CONNECTION (TREAD SIDEWALLS ETC)



IF FLEXIBILITY IS NEEDED BETWEEN TYRES



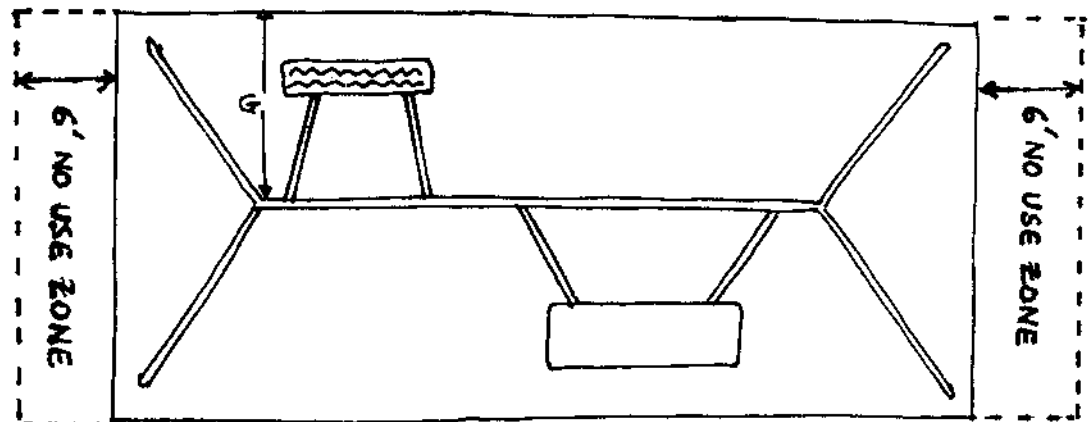
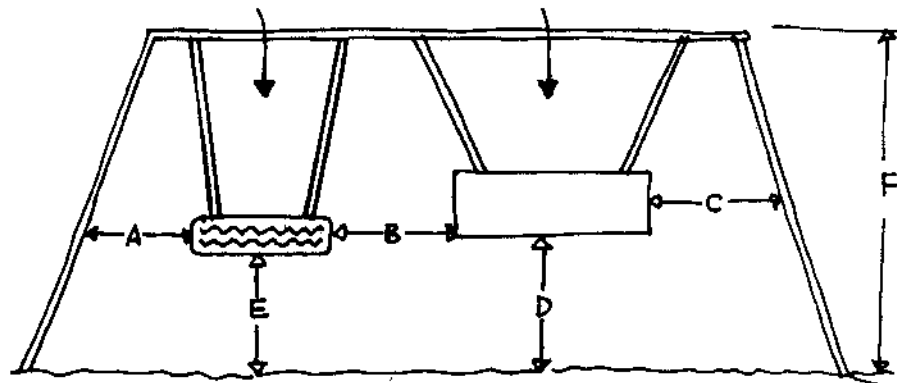
# SWING DIMENSIONS

REGULAR TO/FRO SWINGS  
 NOTE : THERE SHOULD BE NO MORE THAN TWO SWINGS PER SWING FRAME

- INCLUDE SUCH SWINGS AS
- SEATS
  - TYRE
  - TRAPEZE BAR
  - BARREL
  - HANGING LADDERS

SEAT OR TYRE SWING

BARREL SWING

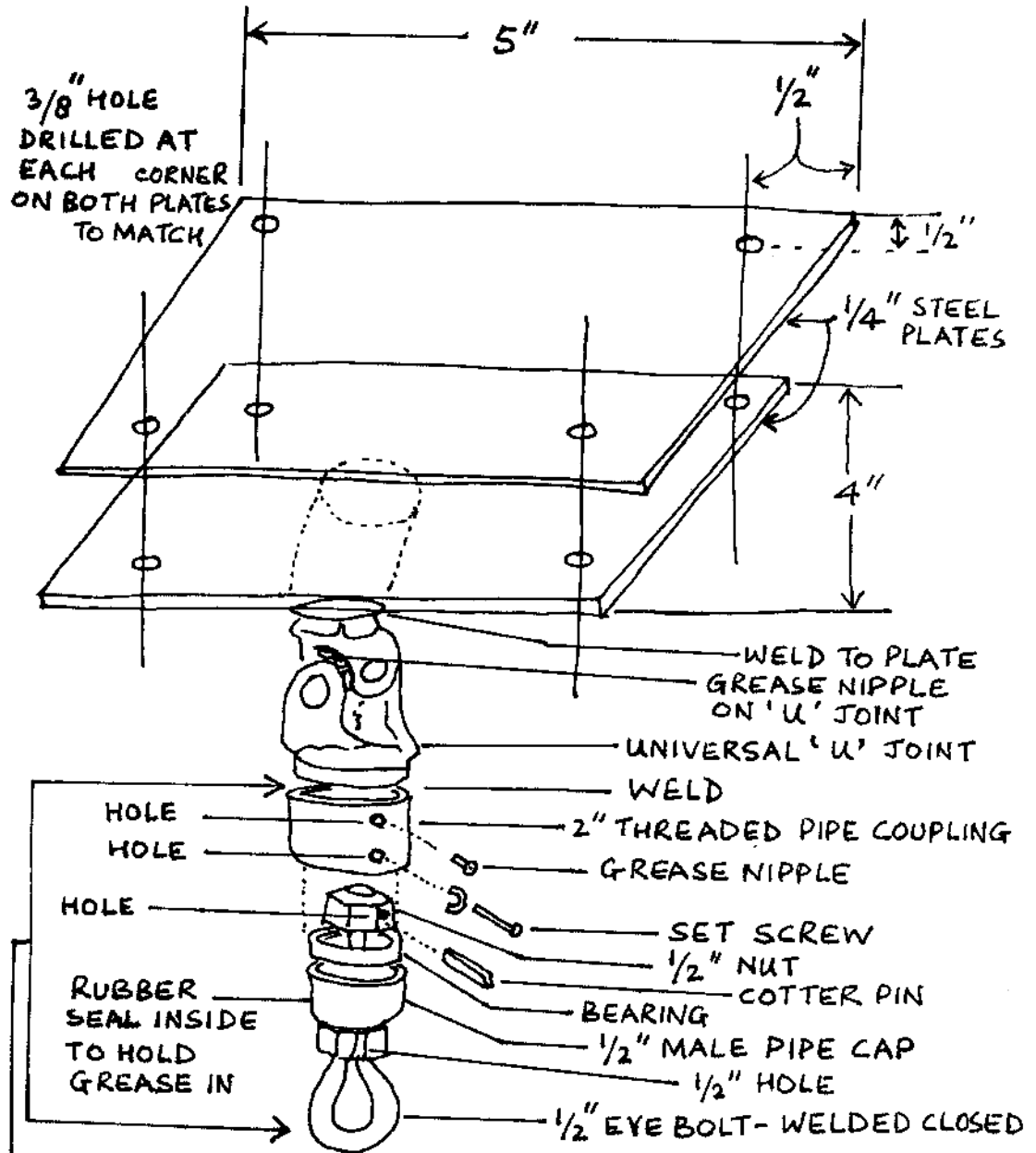


- A - 30"
- B - 24"
- C - 30"
- D - 18"
- E - 11"

F - 7"

G IS TWICE THE LENGTH OF THE SWING ARC IN BOTH DIRECTIONS.

# SWIVEL TYRE SWING ASSEMBLY



THIS CAN ALSO BE MADE FROM A WHEEL RIM WITH A PART OF THE AXLE STILL ATTACHED - USE BOLT HOLES TO ATTACH SWING CHAINS.

## Swivel Tire Swing Assembly Continued

### Notes

Fill coupling with grease after assembly.

If possible bolt plate to “U” joint as well as welding at the centre of plate.

Best to use “U” joint with long “arms” to decrease possible pinch/crush points. “U” joints from old jeeps, tractors or large (4-wheel drive) trucks are the best.

Use 3/8” steel bolts to attach to beam.

If you are using round pipe then bend plates to “clamp” around and tap weld into position.

## *APPENDIX*

### **Sand in playgrounds\***

There are two kinds of sand used in playgrounds; sand for sand Pits and sand under climbing equipment and similar features where there is the possibility of falls from a height.

*Sand pits:* As children use the sand for farming shapes, digging and burrowing, it must hold together when moulded and not collapse too easily. It should therefore be sand that packs well and for this purpose there should be a balanced mixture of Particle sizes ranging from coarse -- Preferably not more than 1.5 mm (1/16 inch) to very fine. Seaside sand is usually suitable but not readily available and well-washed plasterers sand is sometimes acceptable. Wind blown or dune sand should be avoided as it will not hold together unless very wet.

Sandpit sand must be clean, i.e. free from dirt, clay, silt, and oxides of iron or other contaminants. It should be specified as “washed” but this may not always ensure adequate cleanliness. It can be tested by rubbing when damp into a piece of white cloth. If clean there should be no discoloration of the cloth or stain on the hands. As one of the effects of Hashing is to remove the substances such as dirt and clay, which help to bind the sand, it is important that the very fine sands are retained.

On no account any sharp material, such as artificially crushed stone, be included as this can cause cuts and be *injurious* to the eyes.

Depth of sand recommended is 380-450 mm (15”- 18”).

*Sand under climbing equipment:* For this purpose the sand must “give” if it is to help break a fall. It must be non-packing i.e. the opposite of sand.

A good example is wind blown sand such as “dune” sand, as this has uniformly sized and rounded particles, which move easily against each other.

Dune sand does, however, have the disadvantage that when dry it will tend to blow about in the wind and become a nuisance.

Sands with a larger particle size, the majority of which are within the range of say 1.5 to 0.25 mm are therefore preferable provided they are not too abrasive to the skin. Sand used for long jump pits has similar properties and should be suitable.

An alternative to sand is small rounded (marine) gravel or shingle.

A 300 mm (12”) minimum depth of sand, gravel or shingle or similar, e.g. furnace bottom ash, is recommended.

In case of difficulty the Sand and Gravel Association Ltd. 48 Park Street, London W1 is willing to give advice or to suggest possible sources of supply.

## **Maintenance**

### *Sand Pits:*

1. The pits should be raked over daily to remove the surface debris, special care being taken to ensure that no broken glass is left lying about.
2. For busy playgrounds in Urban Districts treatment with chloride of lime should normally be given once a week. More frequent applications will be necessary in the summer months. Treatment at longer intervals is permissible in Rural Areas where playgrounds do not normally get so congested and there is less likelihood of pollution from the atmosphere.
3. The materials required are:

7.5 oz, fluid chloros to 4 gallons of water to each 10 cubic yards of sand.

1 - 2 gallon buckets

1 - 2 gallon watering can with a fine hose.

Method of treatment as follows:

The bucket and watering can are filled with water and half the quantity of fluid chloros is added to each and well stirred with a stick. The solution is distributed

over the surface of the sand with watering can. When empty, the watering can is filled from the bucket and the surface of the sand thoroughly covered. The surface is then hosed evenly with spray attachment in order to dilute the chlorox solution and allow it to penetrate. The sand is then turned over one foot deep and the children allowed to use it. It is important to mix the disinfecting materials thoroughly with the sand. Excessive hosing should, however, be avoided in order to prevent water logging and penetration of decaying vegetable matter. Periodically the sand should be turned over to its full depth to avoid anaerobic conditions.

4. Sand should be changed as soon as it shows signs of becoming *dirty*.
5. Advice on hygiene is obtainable from the local health office.

The sand (or shingle) should be kept free of dirt, debris, broken glass, weeds etc. It should be checked daily. Any tendency to compact should be immediately counteracted by forking.

\* Extracted from a publication of the National Playing Fields Association (NPF), U.K.

## **APPENDIX**

### **IPA and the Declaration of the Child's Right to Play**

#### *International Association for the Child's Right to Play*

IPA is an international, non-governmental organisation (NGO) founded in Denmark in 1961. It is an interdisciplinary organisation and embraces in membership persons of all professions working for or with children. The organisation works closely with many international NGO's and is recognised by the United Nations Economic and Social Council (ECOSOC) and by UNESCO and UNICEF as a non-governmental organisation with consultative status.

IPA is a human rights organisation that shares a feeling of solidarity with children all over the world. IPA endorses the United Nations Convention on the Rights of the Child, particularly Article 31, which states that the child has a right to leisure, play, and participation in cultural and artistic activities. IPA promotes peace education through play and has been appointed as a United Nations messenger of Peace.

IPA attempts to protect, preserve, and promote Children's play as a means of ensuring the maximum development of every individual. Play stimulates creativity and the emotional, cognitive and physical environment; it is a critical aspect of socialisation and environmental education.

IPA members believe that play, along with the basic needs of nutrition, health, shelter, and education, is vital for the development of the potential of all children and the protection and enhancement of their families, cultures and communities. They believe that participation must be strengthened through play leadership and animation.

IPA members include professionals working in education, design, and leisure time facilities, play programming, play leadership-training, toys and play materials. Professional development and exchange takes place through PLAY-RIGHTS, the IPA quarterly magazine; PLAY-JOURNAL; the IPA professional journal; the IPA triennial international conference; regional and national conferences; seminars and study tours; and IPA Resources, London. Membership linkages with action groups in more than forty countries provide for an exchange of ideas and information about innovative, play related non-formal education programs.

#### *IPA Declaration of the Child's Right to Play*

The IPA Declaration of the Child's Right to Play was originally produced in November 1977 at the IPA Malta Consultation held in Preparation for the International Year of the Child (1979). The IPA International Council in Vienna, September 1982, and Barcelona, September 1989 revised it. The IPA Declaration should be read in conjunction with Article 31 of the U.N. Convention on the Rights of the Child (adopted by the General Assembly of the United Nations, November 28, 1989), which states that the child has a right to leisure, play, and Participation in cultural and artistic activities.

#### **What is Play?**

*Children* are the foundation of the world's future.

*Children* have played at all times throughout history in all cultures.

*Play*, along with the basic needs of nutrition, health, shelter, and education, is vital to develop the potential of all children.

*Play* is communication and expression, combining thought and action; it gives satisfaction and a feeling of achievement.

*Play* is instinctive, voluntary, and spontaneous.

*Play* helps children develop physically, mentally, emotionally, and socially.

*Play* is a means of learning to live, not a mere passing of time.

#### **Alarming Trends Affecting Childhood**

IPA is deeply concerned by a number of alarming trends and their negative impact on children's development:

- \*Society's indifference to the importance of Play.
- \*Over-emphasis on theoretical and academic studies in schools.
- \*Increasing number of children living with inadequate provisions for survival and development.
- \*Inadequate environmental planning, which results in lack of basic amenities, inappropriate housing forms, and poor traffic management.
- \*Increasing commercial exploitation of children, and the deterioration of cultural traditions.
- \*Lack of access for Third World women to basic training in childcare and development.
- \*Inadequate preparation of children to cope with life in a rapidly changing society.
- \*Increasing segregation of children in the community.
- \*The increasing number of working children and their unacceptable working conditions.
- \*Constant exposure of children to war, violence, exploitation, and destruction.
- \*Over-emphasis on unhealthy competition and "winning at all costs" in children's sports.

### **Proposal for Action**

The following proposals are listed under names of government departments having a measure of responsibility for children.

#### *HEALTH*

Play is essential for the physical and mental health of the child.

- \* Establish programmes for professionals and parents about the benefits of play from birth onwards.
- \* Ensure basic conditions (nutrition, sanitation, clean water, and air) which promote the healthy survival and development of all children.
- \* Incorporate play into community programmes designed to maintain children's physical and mental health.
- \* Include play as an integral part of all children's environments, including hospitals and other institutional settings.

#### *Education*

Play is part of education.

- \* Provide opportunities for initiative, interaction, creativity, and socialisation through play in formal education systems.
- \* Include studies of the importance of *play* and the means of play provision in the training of all professionals and volunteers working with and for children.



- \* Strengthen *play* provision in primary schools to enhance learning and to maintain attendance and motivation.
- \* Reduce the incompatibilities between daily life, work, and education by involving schools and colleges, and by using public buildings for community play programmes.
- \* Ensure that working children have access to play and learning opportunities outside of the system of formal education.

### *WELFARE*

Play is an essential part of family and community life.

- \* Ensure that play is accepted as an integral part of social development and social cars.
- \* Promote measures that strengthen Positive relationships between parents and children.
- \* Ensure that play is Part of community-based services designed to integrate children with physical, mental or emotional disabilities into the community. Provide safe play environments that protect children against abduction, sexual abuse, and Physical violence.

### *LEISURE*

Children need opportunities to play at leisure.

- \* Provide time, space, materials, natural settings, and programmes with leaders where children may develop a sense of belonging, self-esteem and enjoyment through play.
- \* Enable interaction between children and people of all backgrounds and ages in leisure settings.
- \* Encourage the conservation and use of traditional indigenous games.
- \* Stop the commercial exploitation of children's play, and the production and sale of war toys and games of violence and destruction.
- \* Promote the use of children in sports co-operative game and fair play for children in sports.
- \* Provide all children - particularly those with special needs, with access to a diversity of play environments, toys, and play materials through community programmes such as pre-school Playgroups, toy libraries, and play buses.

### *PLANNING*

The needs of the child must have priority in the planning of human settlements.

- \* Ensure that children and young people can participate in making decisions that affect their surroundings and their access to them.

- \* When planning new, or reorganizing existing developments recognize the child's small size and limited range of activity.
- \* Disseminate existing knowledge about play facilities and play programmes to planning professionals and politicians.
- \* Oppose the building of high-rise housing and provide opportunities to mitigate its detrimental effects on children and families.
- \* Enable children to move easily about the community by providing safe pedestrian access through urban neighborhoods, better traffic management, and improved public transportation.
- \* Increase awareness of the high vulnerability of children living in slum settlements, tenements, and derelict neighborhoods.
- \* Reserve adequate and appropriate space for play and recreation through statutory provision.

### *AFFIRMATION*

IPA is determined to sustain the momentum created by the International Year of the Child in 1979 to arouse world opinion for the improvement of the life of children and

- \* Affirms its belief in the United Nations Convention on the Rights of the Child and endorses its belief in Article 31 of the Convention.
- \* Recognizes that the population of children in developing countries is three-quarters of the world's population, and that efforts directed at the promotion of education and literacy, and the stopping of environmental deprivation would improve the capacities of the poorest.
- \* Affirms its commitment to working with other national and international organizations to ensure basic conditions of survival for all children in order that they may fully develop as human beings.
- \* Acknowledge that each country is responsible for preparing its own course of public and political action in the light of its culture, climate and social, political, and economic structure.
- \* Recognizes that the full participation of the community is essential in planning and developing programmes and services to meet the needs, wishes, and aspirations of children.
- \* Assures its co-operation with U.N. agencies and other international and national organizations involved with children.
- \* Appeals to all countries and organizations to take action to counteract the alarming trends which jeopardize children's healthy development and to give high priority to long term programmes designed to ensure for all time the Child's Right to Play.

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## **Addresses of Resource Persons**

### **Paul Hogan**

Playground Clearing House Inc.  
36 Sycamore Lane  
Phoenixville P.A. 19460 USA

### **Willie Weisz**

Tire Playgrounds Inc.  
P O Box 462  
South Orange NJ 07079 USA

### **Bob Leathers**

Leathers and Associates  
99 Eastlake Road  
Ithaca NY 14850 USA

### **Prue Walsh**

Play Environment Consultant  
30 Argyle St.  
Breakfast Creed QLD  
4010 Australia

### **Chris Clews**

Learning Structure Inc.  
34 Columbia St.  
Portsmouth NH 03801 USA

### **Bernard Van Leer Foundation**

Resources  
P O Box 82334  
**2508** EN The Hague  
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