CHAPTER FIVE

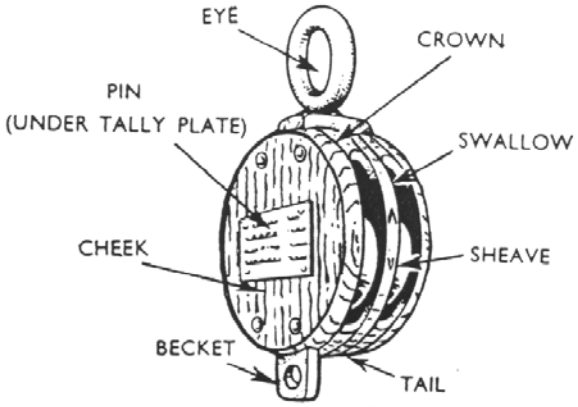
GENERAL RIGGING

0501	**Blocks**	**Parts of a Block**
0502	**Types of Block**	**Internal-bound block** **Metal Block** **Synthetic-resin Bonded Fibre Block** **Snatch Block** **Examples of Blocks.**
0503	**Purchases and tackles**	**Parts of a tackle** **Reeving to Advantage and Disadvantage** **Mechanical Advantage** **Velocity ratio** **Friction in a tackle** **Examples of tackles** **Racking and Choking**
0504	**Associated Rigging Fittings**	**Shackles** **Parts of a Shackle** **Types of rigging shackle**
0505	**Thimbles**	
0506	**Hooks**	**Parts of a Hook**
0507	**Mousings**	**Mousing a Hook** **Mousing a Shackle** **Mousing a Slip**
0508	**Strops**	**Types of strop** **Attaching a Strop to a spar** **Securing a Strop on a rope**
0509	**Seizings**	**Flat Seizing**
0510	**Lashings**	**Square and diagonal**
0511	**Stoppers**	**Natural Cordage Stopper** **Man-made Fibre Cordage Stopper** **Chain Stopper**
0512	**Examples of Practical Rigging Exercises**	**A Standing Derrick** **A Swinging Derrick** **Sheers** **A Gyn** **Simple Ropeway** **Holdfasts** **Marker Buoy**

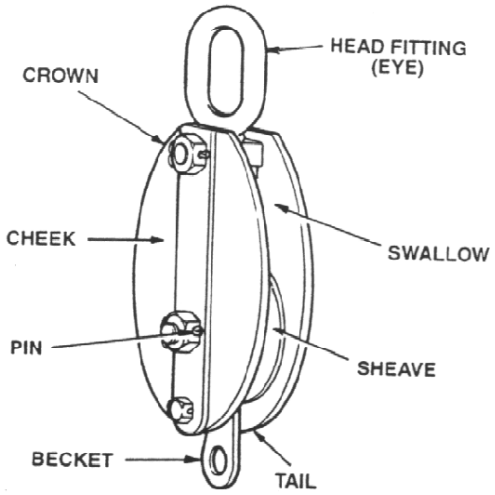
0501 BLOCKS

A block is a portable pulley, made of wood, metal, synthetic-resin bonded fibre (SRBF) or combinations of materials. Smaller commercially produced blocks are constructed of stainless steel and plastic (mainly used for boating purposes).

0501.1 Parts of a Block



Older style Internal Bound Block



Synthetic-Resin Bonded Fibre Block

General Information

Blocks can be fitted with a hook as an alternative to an eye, and the hook or eye can be fixed or swivel types. They may have more than one sheave; a single block has one sheave, a double block has two and a triple has three.

Wooden Blocks are classified by their size, which is the length from crown to tail measured in millimetres round the shell; and it will take a rope one-tenth of its size. (Rope measured by its diameter in millimetres).

Metal Blocks are classified by the size of rope for which they are designed and this is normally marked on a plate affixed to the cheek.

SRBF Blocks are also classified by the size of rope for which they are designed and this is stamped on the binding of the block.

0502 Types of Block

0502.1 Internal-bound Block (IB)

This type has a shell partly of wood and partly of metal, and is a version of a wooden block. The metal portion consists of a fork shaped steel fitting called `the binding' which incorporates both the eye or hook and becket when fitted. The sheave is made of phosphor bronze which is less corrosive and does not create sparks as the pin is made of steel. This type of block can be used for rope or wire. A tally plate is found only on this type of block; it has two practical purposes, to hold in the pin and to supply information about the block. This information will contain the Pattern number (a computerised

number to identify the block), the size of the rope for its use and the safe working loads for use. In addition to allow for lost or damaged plates, information about the block will also be stamped on the hook or eye.

This will contain the pattern number, the size of the rope to be used, the tested weight (which will be higher than the safe working load) and the test date (month and year). All tests are normally carried out in HM Dockyard Test Centres.

Very little maintenance is required for these blocks. Even if the wood is split or chipped it can be repaired by using a wood filler or synthetic resin paste. The swivel hook or eye, whichever is fitted, should be kept free of dirt and given a light oiling to ensure it swivels freely. As most of the metal parts are galvanised only the pin requires a light coating of grease to ensure free running of the sheave. The sheave should be checked for wear periodically, any rough edges should be filed down to prevent damage to rope.

0502.2 Metal Block

Usually built of steel plates and fittings, their shells have a binding which supplies the strength but the cheeks are of light plating. Some types have their shells cast in one piece. Where possible metal blocks should be used when using wire rope. (Built-up metal blocks which were the main type of block used by the RN for awning tackles make ideal heel tackles for rigging evolutions).

A light application of grease should be used on the moving parts. Steel blocks showing signs of rusting should be wire scrubbed, treated with a rust inhibitor and lightly greased. A coating of linseed oil will prevent rust on the shell. Galvanised metal blocks generally require less maintenance, a light oiling normally only required. The pin which is of steel should be given a light coat of grease or oil. Wire brushes should not be used on galvanised metal blocks as this may damage or remove the coating, instead a nylon pad may be used to remove any corrosion.

0502.3 Synthetic-resin Bonded Fibre (SRBF) Block

This block is built up of steel bindings, and its means of attachment and sheave pins are of steel. The cheek plates and sheave(s) are made of synthetic-resin bonded fibre. These blocks are for use with natural fibre and man-made fibre ropes only and can be single, double, triple or snatch blocks with safe working loads of one, two or four tonnes. They must not be used with wire rope. (This type of block is currently on issue to units. Because of the block's size it is not often practical to use these as heel tackles, although they make ideal purchases).

0502.4 Snatch Block

These are single metal, internal bound or SRBF blocks, in which part of the shell is hinged to form a `gate' which allows a bight of a rope to be inserted into the swallow from one side. They should not be used when a solid block is available for the job and they should NEVER be used when the safety of life depends on them because the gate may open if a sideways pull is exerted. Ideally these blocks should be used for lead blocks during rigging evolutions.

The maintenance required depends on the type of block, additionally the gate will require a light greasing or oiling. Avoid applying too much grease to pin springs as this generally attracts dirt and more frequent checks and maintenance may be required.

0502.5 Examples of Blocks

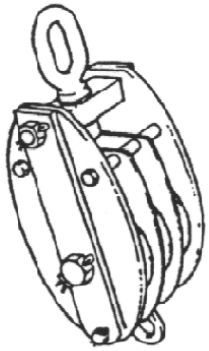
Metal Blocks

Cast type

Built up type

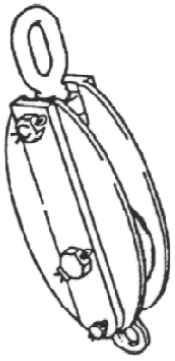
Synthetic-resin Bonded Fibre (SRBF) blocks

Treble block



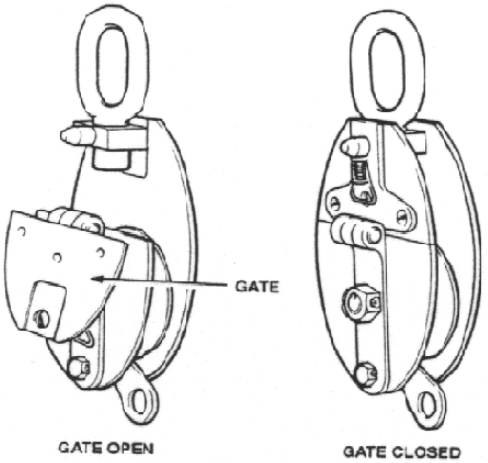
Double block

Single block

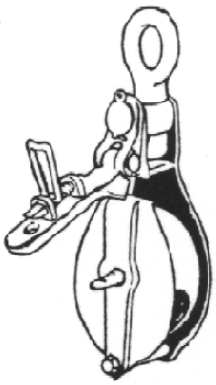


Snatch blocks

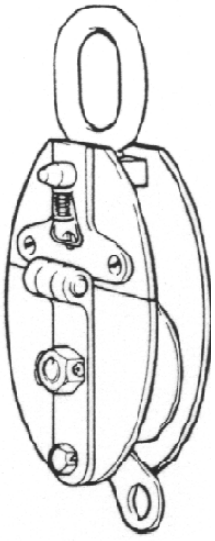
The principle of the block
(showing the gate open and closed)



Metal



SRBF

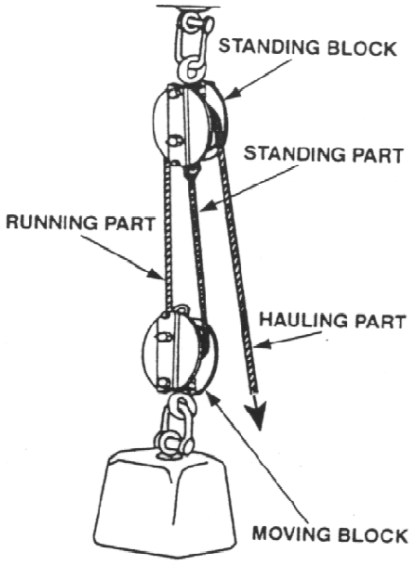


0503 PURCHASES AND TACKLES

A purchase is a mechanical device by means of which an applied pull or force is increased; it may be a system of levers, a system of revolving drums or wheels geared to one another, or a combination of blocks or pulleys rove with rope or chain.

A tackle (pronounced `taycle') is a purchase consisting of a rope rove through two or more blocks in such a way that the force of any pull applied to its hauling part is increased by an amount depending on the number of sheaves in the blocks and the manner in which the rope is rove through them.

0503.1 Parts of a Tackle



0503.2 Reeving a Tackle to Advantage and to Disadvantage

The number of parts at the moving block, and therefore the mechanical advantage, is always greater when the hauling part comes away from the moving block; and such a tackle is said to be ***`rove to advantage'***. Conversely, a tackle in which the hauling part comes away from the standing block is said to be `rove to disadvantage' . When practicable, rig a tackle so that the hauling part leads from the moving block and make the block with the greater number of sheaves the moving block.

0503.3 Mechanical Advantage (MA)

This is the amount by which the pull on the hauling part is multiplied by the tackle. If friction is disregarded, this is equal to the number of parts of the fall at the moving block. (e.g. if there are two parts at the moving block the mechanical advantage is two, a pull on the hauling part of 50kg would, if friction is disregarded, hold a weight of 100kg).

0503.4 Velocity Ratio (VR)

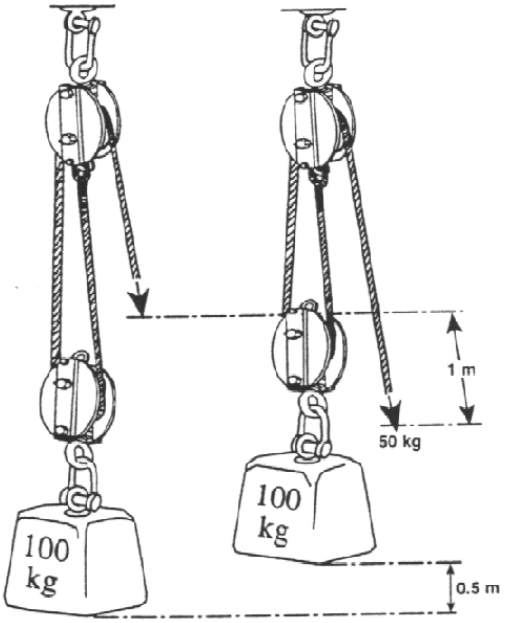
Mechanical Advantage is gained only at the speed of working. The ratio between the distance moved by the hauling part and that moved by the moving block is known as the Velocity Ratio (VR) and is always equal to the number of parts of the fall at the moving block.

0503.5 Friction in a Tackle

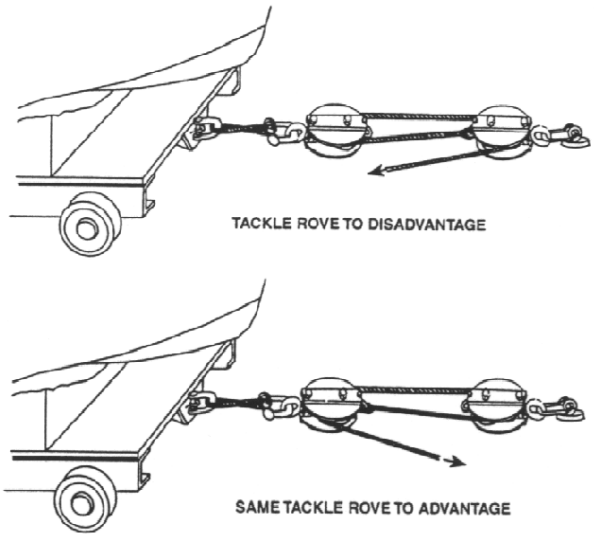
When a tackle is being worked considerable friction is set up, both in the bearings of the blocks and within the fall as it bends round the sheaves. This friction accounts for the difference between the velocity ratio (VR) of the tackle and its mechanical advantage (MA). (It is important therefore to ensure that the sheaves run as smoothly as possible and that the tackle is correctly made up so as to ensure that the moving parts do not cross over and rub against each other).

0503.6 Examples

Mechanical Advantage & Velocity Ratio of a Tackle



Tackles rove to Disadvantage and Advantage



0503.7 Tackles and Purchases

These are considered to be the only types found in units or required to be used within the Training Syllabus.

Runner - consists of a rope rove through a single moving block. As there are two parts of the fall in the moving block, the VR is 2 and the MA is 1.82.

Single Whip - consists of a fall rove through a single block; no mechanical advantage is gained. It is used for hoisting light loads.

Double Whip - consists of two single blocks rove with the standing part of the fall made fast near, or to, the upper block. It cannot be rove to advantage. The VR is 2 and the MA 1.82.

Luff - is a purchase 24mm or greater. It consists of a double block and a single block, with the standing part of the fall made fast to the single block. To Disadvantage the VR is 3 and the MA 2.3, to Advantage the VR is 4 and the MA 3.08.

Two-fold Purchase - consists of two double blocks and is a useful general purpose tackle. To Advantage the VR is 5 and the MA 3.75, to Disadvantage the VR is 4 and the MA 2.86.

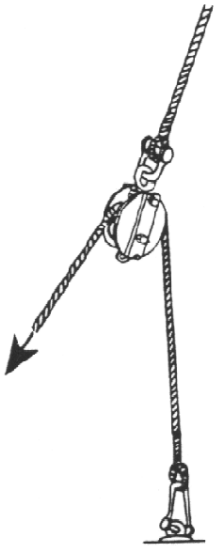
Three fold Purchase - consists of two treble blocks and is used where a heavier weight is required to be lifted. To Advantage the VR is 7 and the MA 4.37, to Disadvantage the VR is 6 and the MA 3.75.

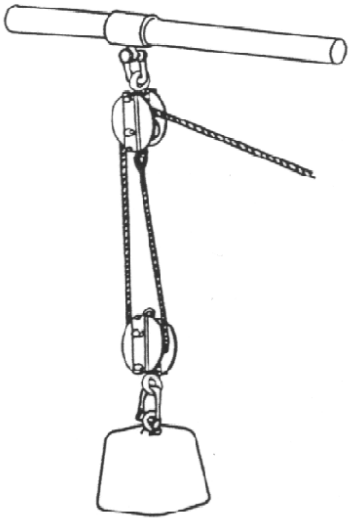
(It is common practice in a number of circumstances, mainly because of convenience, to use a tackle rigged to disadvantage. When dealing with light loads there is very little noticeable difference however, with heavier loads try to rig and use the tackle to advantage where there may be a very noticeable difference).

<u>No block is to be used for lifting loads greater than the Safe Working Load shown on it.</u>

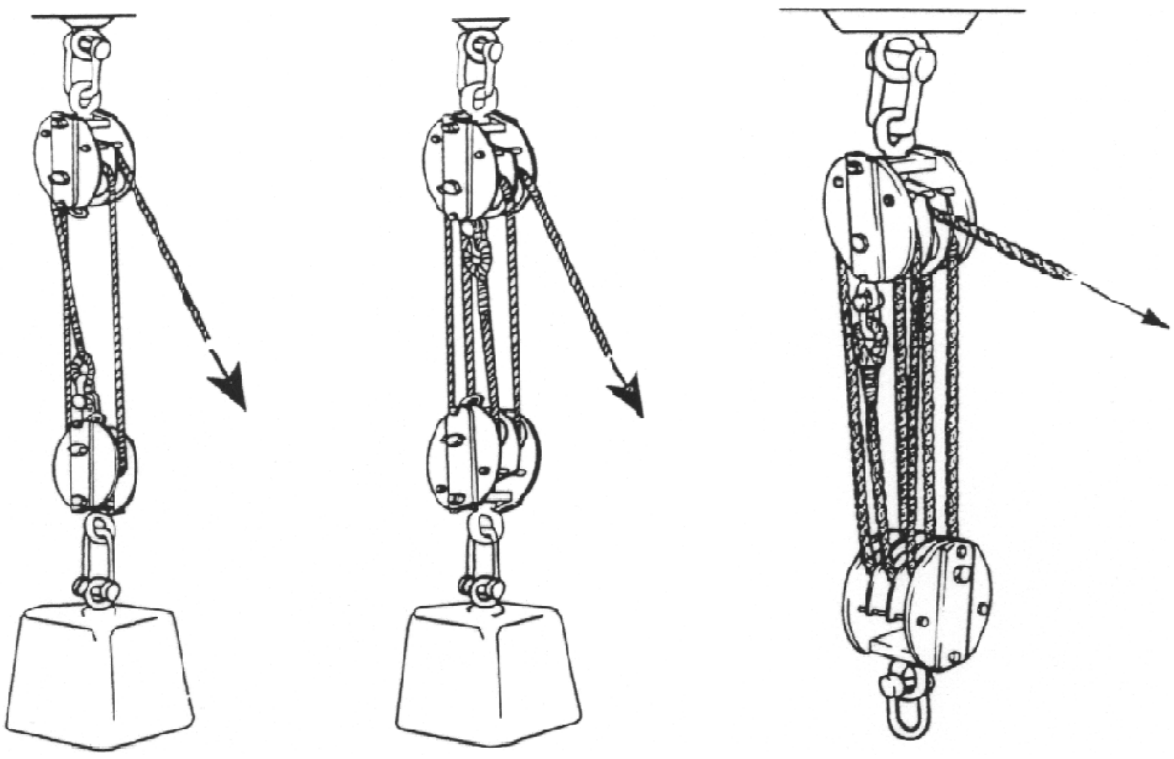
Examples of Whips and Tackles

A Runner ***A Single Whip*** ***A Double Whip***





A Luff ***A Two Fold Purchase*** ***A Three Fold Purchase***

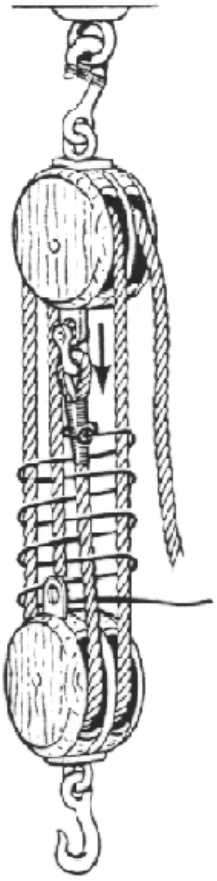


0503.8 Racking and Choking

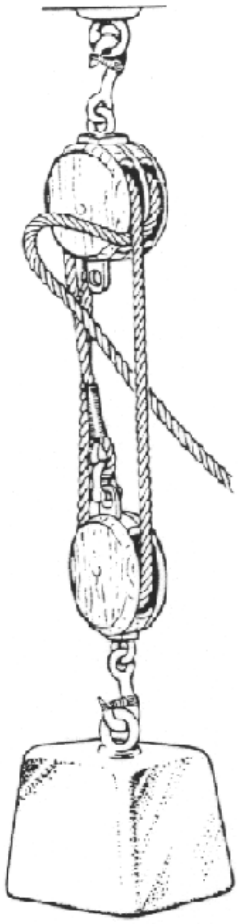
Racking
This is used to hold a tackle temporarily whilst the fall is being belayed; if the strain is too great for this to be done by holding the opposite running parts, or the running and standing parts together with the hands. The racking turn are passed with a short length of line, taking figure of eight turns round the standing and running parts, the end being held in the hand or secured round the parts. The hauling part is kept clear of the racking in order for it to be moved. Racking is the better option as no additional strain or wear is put onto the rope.

Choking the Luff
This method of holding a small tackle temporarily should only be used when no cleat is available and the load is light. The bight of the hauling part is pulled through the centre of the
moving parts and wedged between the moving parts and the block. This method is bad for the
rope as it has to be jammed into the swallow which can cause damage to the rope. It is unsafe as the weight of the bight dropping often causes the rope to be pulled out thereby causing the
weight to drop. In addition to this, if the hauling part is accidentally pulled, the weight may drop
without control. In the interests of safety this method should not be used unless it is absolutely
necessary, the preference being to Rack the tackle.

Racking



Choking the Luff



0504 ASSOCIATED RIGGING FTTTINGS

0504.l Shackles

These are coupling links used for joining ropes, webbing and chain together or to some fitting
and those supplied by the Royal Navy (and Sea Cadet Stores) are usually forged from carbon
magnesium steel. Shackles are available commercially from a number of sources either forged from steel or stainless steel. Those shackles supplied from HM Dockyards show a test load and a test date most commercial shackles do not. (Test loads are not for each individual shackle but calculated from a specimen test to apply to a particular size of shackle).

0504.2 Parts of a Shackle

The ends of a shackle are called the lugs, the space between them is called the jaw, and the part opposite the jaw is called the crown. The inside width or length of a shackle is called the clear and the jaw is closed by a removable bolt which passes through a hole in each lug.

All rigging shackles are supplied as `lugged shackles', the U-shaped ones with straight lugs are called Straight shackles, and those which have curved lugs are called Bow shackles. There are different types of straight and bow shackle and these are usually named by reference to the manner in which its bolt is secured in place.

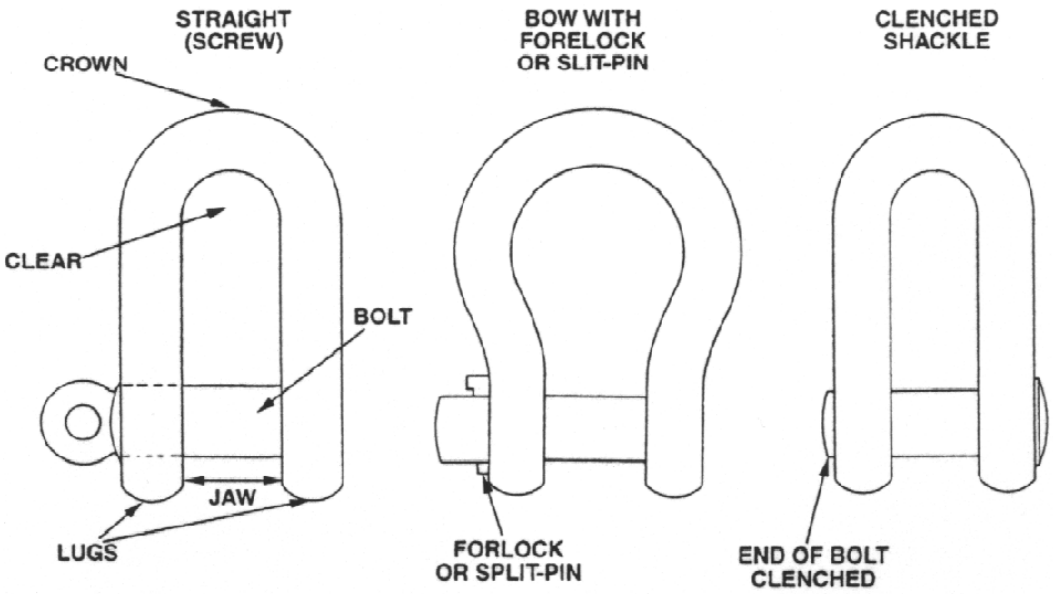
0504.3 Types of Rigging Shackle

Screw shackle - may be a bow or straight shackle. The end of the bolt is screwed into one of the lugs and the bolt is fitted with a flange at its head. This type of bolt should be moused.

Fore-lock shackle - may be a bow or straight shackle. The end of the bolt projects beyond one of the lugs and a flat tapered split-pin (fore-lock) is passed through a slot in the end of the bolt. It is secured by opening the jaw of the pin. The fore-lock may by attached to the shackle by a keep chain or a length of wire.

Split pinned shackle - may be a bow or straight shackle. This type of shackle is of similar design to the fin and fore-lock shackle, but is supplied with a galvanised split pin to serve the same purpose as a fore-lock. The pin may be attached to the shackle by a keep chain or a length of wire.

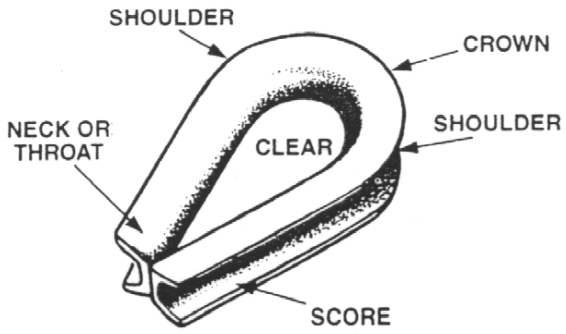
Examples of Rigging Shackles



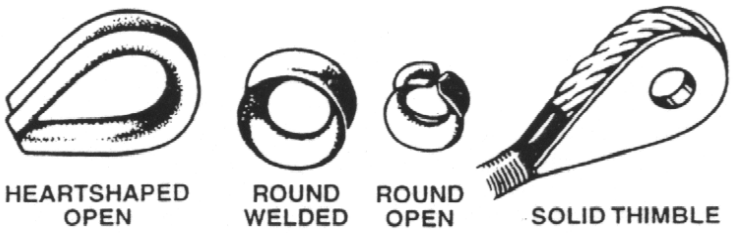
0505 THIMBLES

Thimbles are used and spliced into the end of a fibre or wire rope to take the chafe of a shackle or shackle bolt and also to support the eye formed in the rope. The support given by the thimble prevents a bad nip in the rope when under tension. They are classified according to the diameter of the rope for which they are intended and also their shape; most thimbles being manufactured of galvanised steel, although they may be made of stainless steel, phosphor bronze or polyamide.

Thimbles are either solid, round or heart-shaped and open or welded at the neck; the gap formed at the neck can be sprung open to allow the eye of a tackle hook or lug of a shackle to enter.



Parts of a Thimble



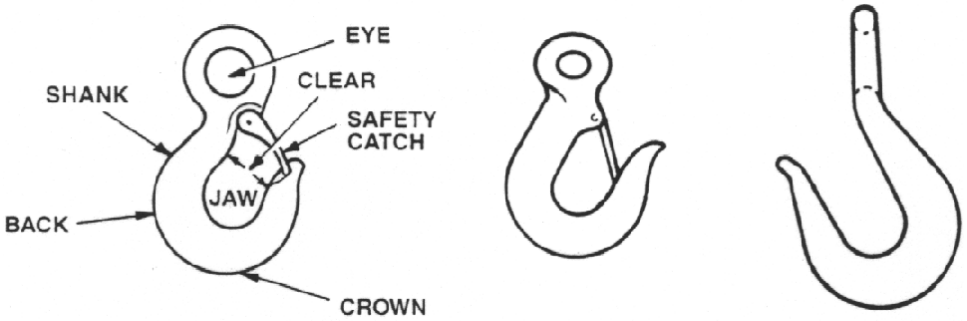
0506 HOOKS

There are various types of hooks available. Most are manufactured of carbon manganese steel, and are generally much weaker than shackles of similar size. Open (tackle) hooks must always be moused when in use. Safety hooks are manufactured with a fitted safety catch (spring-mousing) and should always be used when lifting heavy objects.

0506.1 Parts of a Hook

The point of the hook is called the bill, the body is called the shank, and the bottom the crown; the part opposite the bill is the back; the jaw is the space between the bill and the top of the shank, and the clear is the inside diameter of the crown.

Hook with Safety Catch ***Spring Hook*** ***Tackle Open Hook***



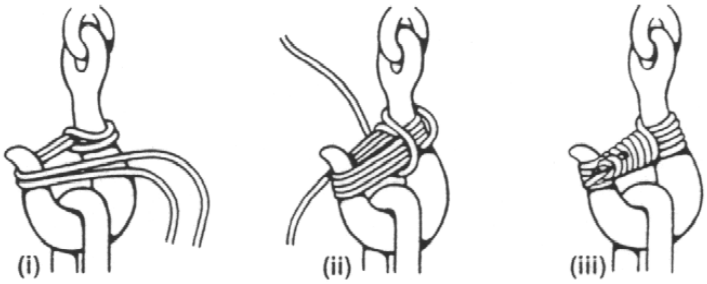
0507 MOUSINGS

A mousing is a length of line or wire which is used to prevent the screw of a shackle undoing or to prevent an open hook from unhooking. Pins in slips can also be moused with wire to prevent the pin from falling out and the retaining hooks on the gate of an IB Snatch Block may also be moused with wire.

0507.1 Mousing a Hook

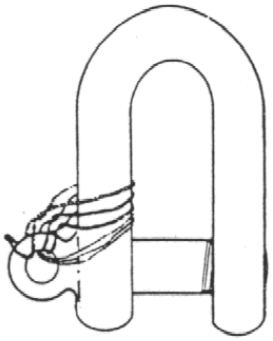
A length of line will provide a tighter mousing in preference to wire. The line should be

middled and looped round the shank then passed around the bill and shank a number of times; one end is then taken around the turns and pulled taut finally securing both ends of the line with a reef knot. By tightening around the turns this will prevent the loops from slipping over the bill.



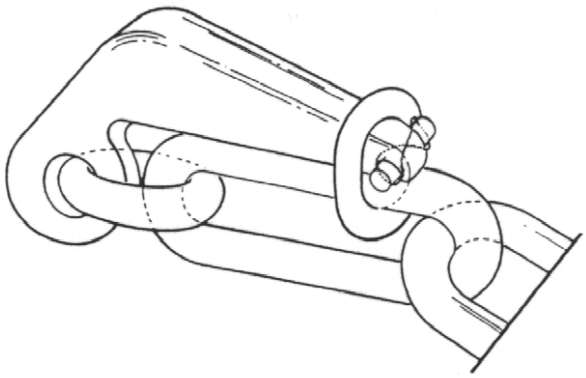
0507.2 Mousing a Shackle

A length of wire is used and three or four turns are passed round the lug and through the eye of the pin and the ends are then twisted tightly together. Surplus wire is cut off.



0507.3 Mousing a Slip

A length of wire is used and figure-of-eight turns are taken around the exposed ends of the pin.



0508 STROPS

A strop is a ring of cordage or wire rope, which can be used to pass round a rope, spar or other fitting so as to provide an eye for attaching a hook or shackle.

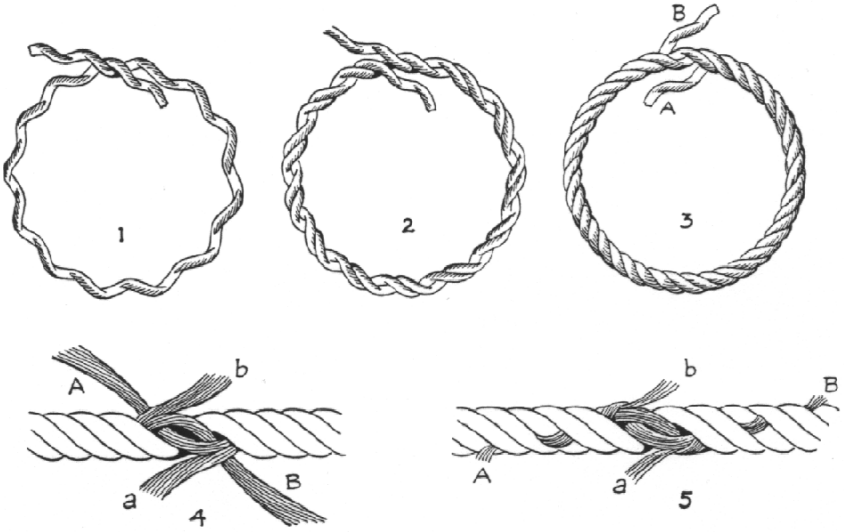
0508.I Types of Strop

Common Strop - this is made from a short length of rope with the ends bent or spliced together. A Common Strop made from hawser laid rope may be made up using a single strand of rope laid up in the form of a grommet. This will provide a stronger strop as it will be laid up as for the original rope.

Bale Sling Strop - this is of similar construction to the common strop but much longer. It is primarily used as a sling for hoisting larger objects.

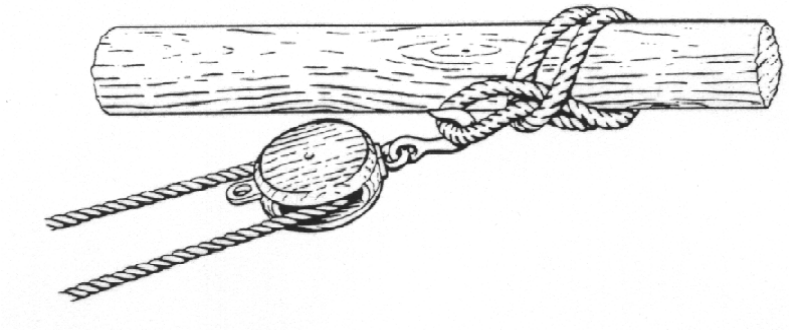
Salvagee Strop - this is used for the same purposes as the common strop, but has the virtue of being able to grip a spar, or other object, more strongly so that it will withstand a sideways pull. It is made of spunyarn and has no specified length or breaking strain. (To make the strop, use two pegs, nails (or even chair legs) at a set distance apart; pass the spunyarn around both pegs keeping the spunyarn tight. When the strop is of the required thickness marl it down with a series of marlin hitches and finish by stopping the loose ends).

Grommet Strop - this may be long or short and differs from the other strops only in its construction: It is formed from one strand laid up around its own part to form a ring: When complete it will resemble the original laid up rope. A wire grommet strop is the strongest type of strop used and is therefore used for the heavy work.



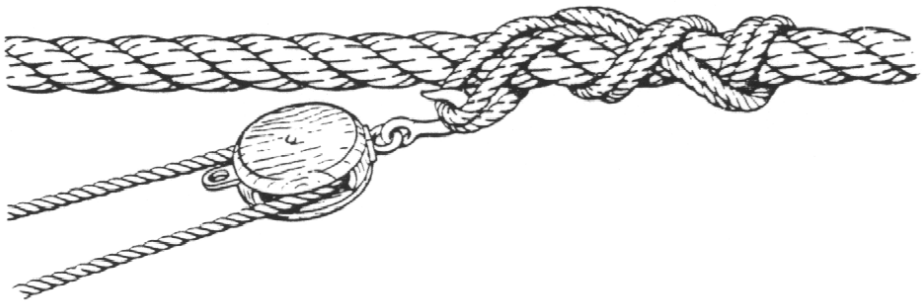
0508.2 Attaching a Strop to a Spar

Use a common strop, loop round the spar and pass one end through the loop of the other. If the strop has been joined with a short splice ensure that the splice is round the spar and not forming part of the eye on which to attach the hook or shackle. (If the pull is from one side so that a strong grip is required, use a salvagee strop).



0508.3 Securing a Strop on a Rope

Use a common or salvagee strop, middle it on the rope; overlap the bights in opposite ways andthe hook, or shackle is secured to both parts.



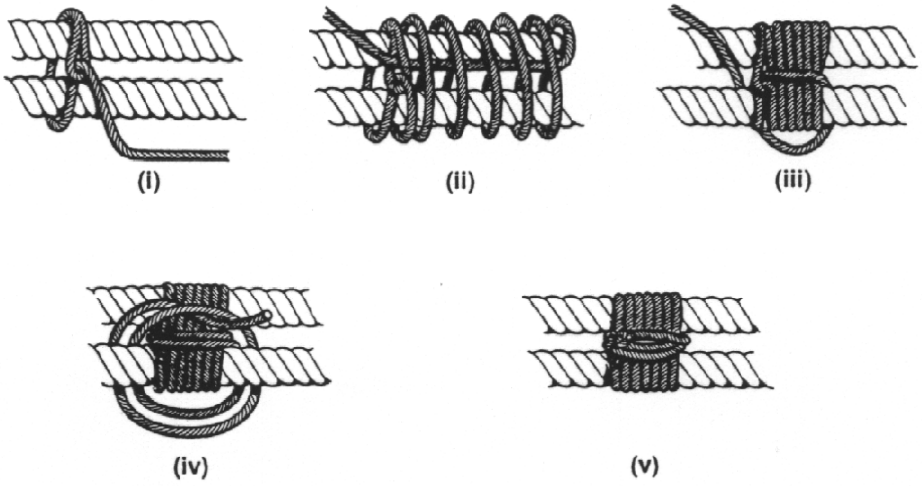
0509 SEIZINGS

A seizing is used to bind two pieces or sections of rope or wire together; (an example of this is when it is necessary to convert a soft eye splice into a hard eye splice by simply seizing in a thimble), additionally two poles may be lashed together using a number of seizings.

All seizings on cordage are begun by making a small eye in the end of the seizing stuff and a timber hitch is used when securing the seizing to a spar (s).

0509.1 Flat Seizing

This is a light seizing used when the strain on both parts of the rope is equal. Having made an eye in the seizing stuff pass this round both parts and pass the end through the eye, taking care to keep the eye in the centre and clear of both parts (i). Take approximately 11 turns loosely round both parts then pass the end back through the turns bringing the end up through the eye (ii). Pull all the turns taut and haul the slack through the eye (iii); finish with a clove hitch around the centre. (If using small hawser laid rope for the seizing and to ensure that it does not come undone, finish off the end with a crown and wall knot close up to the hitch).



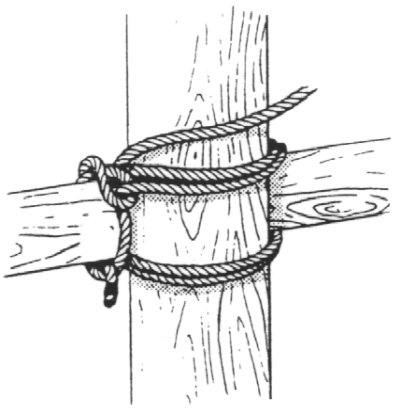
(Other seizings currently included in the Admiralty Manual of Seamanship are not included in the Sea Cadet Seamanship syllabus).

0510 LASHINGS

Lashings are used when it is necessary to secure two poles or spars together. A length of rope or spunyarn is used for the lashing.

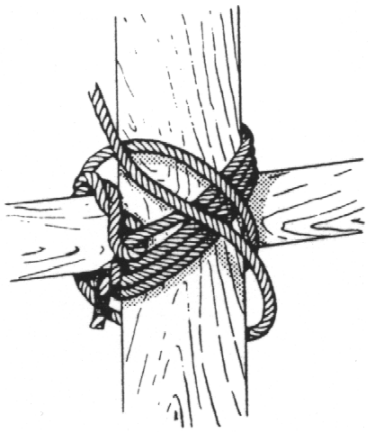
0510.1 Square Lashing

This is used when the poles or spars to be secured are at right-angles to each other. Make fast one end of the rope to one of the spars with a timber hitch and haul it taut. Then crossing at right angles continue to lash until sufficient turns have been taken. Keep the rope as tight as possible at all times and avoid riding turns. To ensure that the turns are bound tight, finish by taking two or three frapping turns around the parts between the spars, and make fast with a clove hitch round all the parts or round one of the spars.



0510.2 Diagonal Lashing

This is used when the poles or spars are to be secured at an acute angle to each other. Make fast one end using a timber hitch then pass as many turns as are required diagonally round both spars. Then bring the end up and over one spar and take a few more turns across the opposite diagonal, finishing off with frapping turns as for the square lashing.



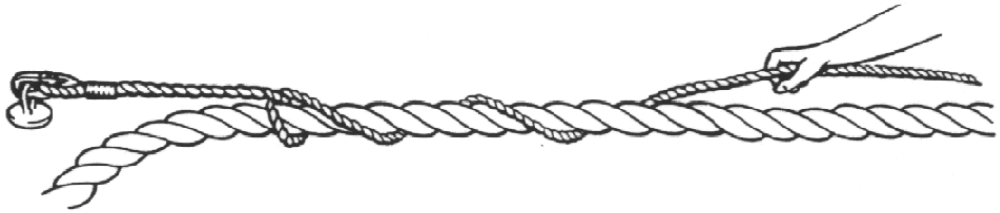
If two or more poles or spars are required to be lashed together side by side, a lashing in the form of a flat seizing should be used. The number of seizings required will vary depending on the length of the poles or spars at the join. (Two wedges or spikes are recommended to keep both poles or spars apart sufficiently to apply frapping turns). A minimum of three seizings should be used, one seizing complete with frapping turns at each end of the join, applied as tightly as possible; the third centrally placed between both of the other seizings. (If the third seizing is applied taut it will take up any of the slackness left by the other two. Without the third seizing the poles will tend to give when stood upright because the frapping turns may be flexible).

0511 STOPPERS

To belay a rope, which is under strain, the strain must be taken temporarily with a stopper. The type of stopper used depends on whether it is to hold a natural fibre, a man-made fibre or a wire rope and on the strain it is required to take.

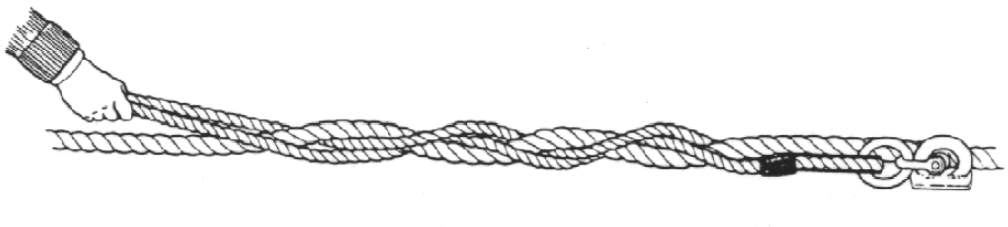
0511.1 Natural Cordage Stopper

This is used for fibre hawsers only and consists of a length of natural cordage made fast to an eyeplate or other fixture. The stopper is laid alongside the hawser with its tail pointing towards the source of the strain; the tail is half hitched round the hawser ***against the lay***, and then dogged round the hawser with the lay ; the end is then held by hand or stopped to the hawser.



0511.2 Man-made Fibre Cordage Stopper

This is used for man-made fibre hawsers and consists of a length of polyester, middled to form two tails and made fast to an eyeplate or similar fixture. The stopper is laid alongside the hawser with its tails pointing towards the source of the strain; the tails are passed by crossing them under and over the hawser in the direction of the source of the strain. The ends are kept in hand or stopped to the hawser.



0511.3 Chain Stopper

This is used for wire hawsers only and consists of a length of chain made fast to an eyebolt or similar fixture. The stopper is laid out alongside the hawser with the tail pointing towards the source of the strain; the tail is half hitched round the hawser with

the lay, then dogged round the hawser against the lay; the end is then held by hand or stopped to the hawser.

0512 EXAMPLES OF PRACTICAL RIGGING EXERCISES

0512.1 A Standing Derrick

This is a single spar stayed by rigging and having a tackle at its head for hoisting a load. Its head is supported by a topping lift , or, if there is no suitable overhead attachment point for a topping lift, it is supported by a back guy. Side guys are fitted to give lateral support, and if there is a suitable attachment point, a martingale or fore guy may be led downwards from the head to prevent the head from springing upwards or backwards when hoisting or lowering a load.

To Rig a Standing Derrick - Strops for attaching the purchase and topping lift (or back guy) are placed over the head of the spar, and are prevented from slipping down either by wooden projections called ***thumb pieces*** (blocks of wood screwed or nailed in place), or by a rope collar (put on the spar like a whipping). These strops should lie close together so as to avoid a bending stress on the spar. The guys, which consist of single parts of rope or cordage, are then middled and clove hitched over the head of the spar, above the strops, tackles being attached if required. The heel of the derrick rests in a shoe (a block of wood with a turned out recess) to protect the deck, and is kept in place by tackles, (heel tackles), which must be led so that they will support it in every direction, particularly from the direction that the derrick will be raised and lowered. The strops for the heel tackles must be kept as low as possible, otherwise the tackles will be heavily stressed as the derrick is raised.

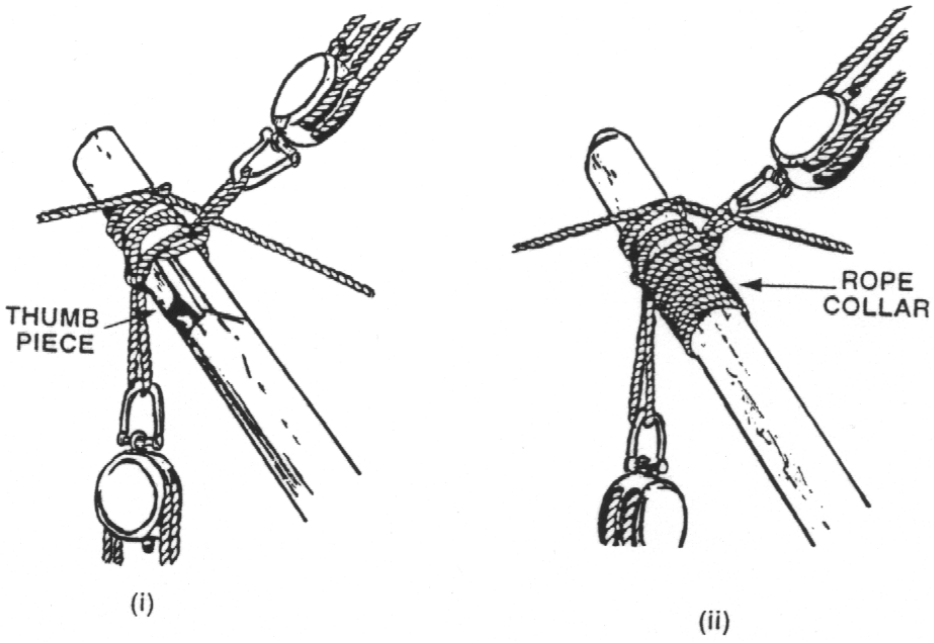
Handy hints:

i) If three tackles are used they should be secured 120 degrees apart so that they take equal strain.

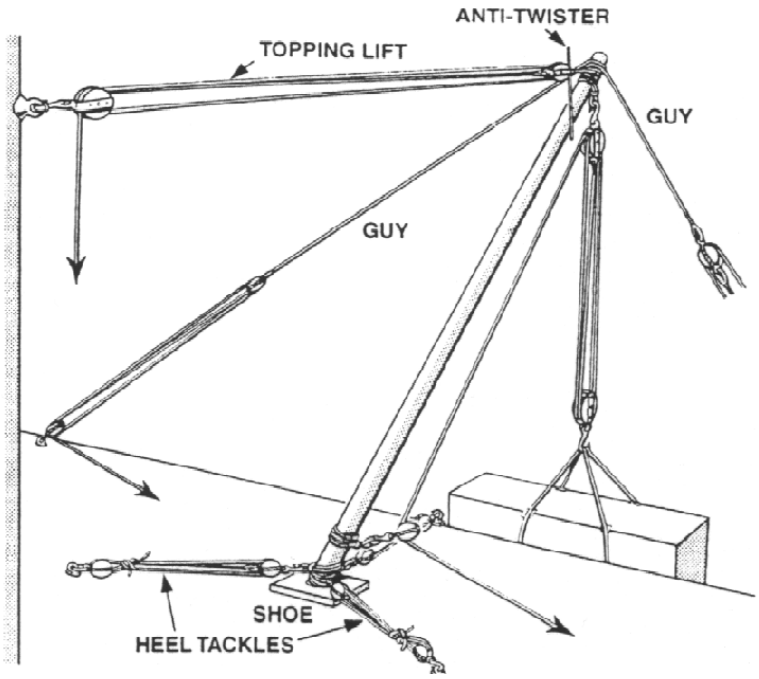
ii) Attach four strops around the base of the spar, three for the heel tackles,
the fourth to hold a lead block for the purchase.

iii) The bottom strop is used for the lead block (and will pull upwards), the top strop is used for a heel tackle (to pull downwards), so that when under strain will result in both strops forcing towards each other locking the other strops and preventing them a1l slipping.

Methods of Rigging the Head of a Derrick Using Rope Collars or Thumb-pieces



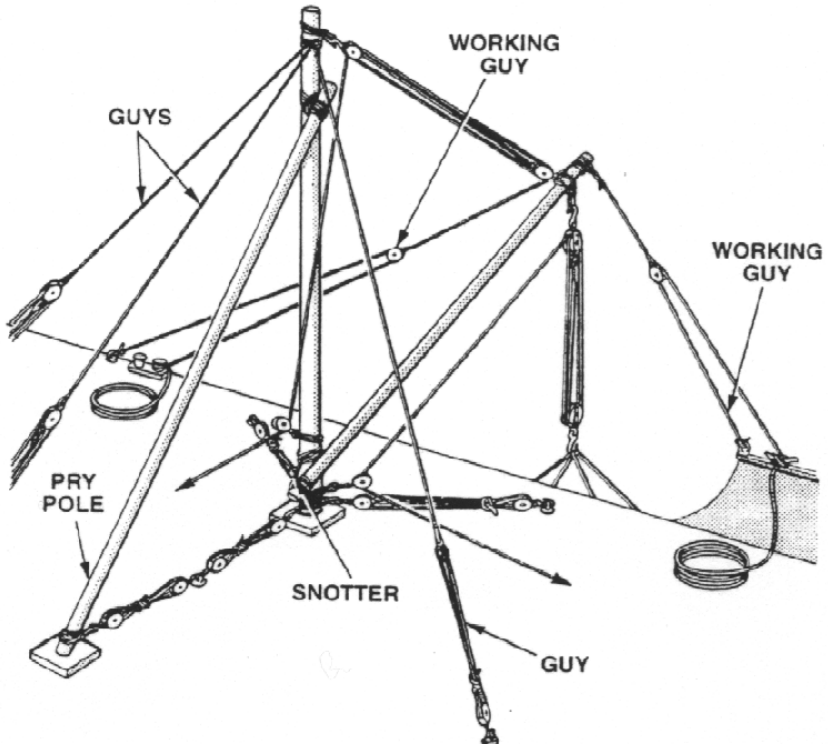
Example of a Standing Derrick



0512.2 A Swinging Derrick

This is made up of two spars, one upright and well stayed by guys, and the other secured to the first by a strop called a snotter and a topping lift; so that it forms a swinging boom. Working guys are led from the head of the boom as in a permanent derrick, and the boom can be raised, lowered and slewed (swung) through an angle of

up to 120 degrees when the load is slung. This type of derrick is not suitable for heavy loads because of the stress imposed on the snotter.

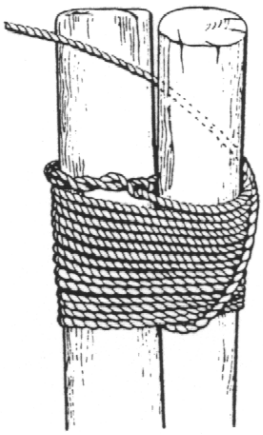


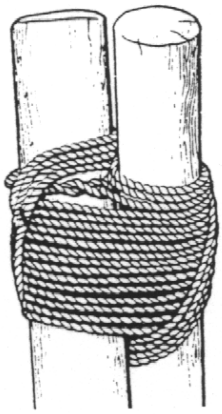
0512.3 Sheers

These consist of a pair of spars called legs, which are lashed together and crossed near their heads; the cross being called the crutch. They are supported in a vertical or an inclined position by rigging, and a tackle for hoisting the load is secured to the crutch. The overhead rigging consists of either a topping lift and martingale or a back guy and fore guy; as sheers need no lateral support, side guys are not fitted. If a topping lift is fitted it should be led to a point aloft so that it makes, as nearly as possible, a right-angle with the sheers ***when they are loaded.***

To Rig Sheers - The spars for the legs are laid side by side, with their heels together and their heads supported conveniently clear of the deck; then lashed together. The legs are first crossed and the lashing is made fast to one leg by a timber hitch, either above or below the cross, and then a sufficient number of round turns (***usually 14 or more***) to cover the cross are taken round both legs. The end is then brought up between the legs, passed down between them on the opposite side of the cross, and brought up again as before, so as to form a frapping turn binding the whole lashing together. Four or five frapping turns are applied and the lashing is completed by a clove hitch taken round the leg opposite to the one to which it was originally attached; it is important that the frapping turns are correctly applied, close to each other, and hauled taut. Choice of the rope used for the head lashing depends on the size of the spars and the weight to be lifted.

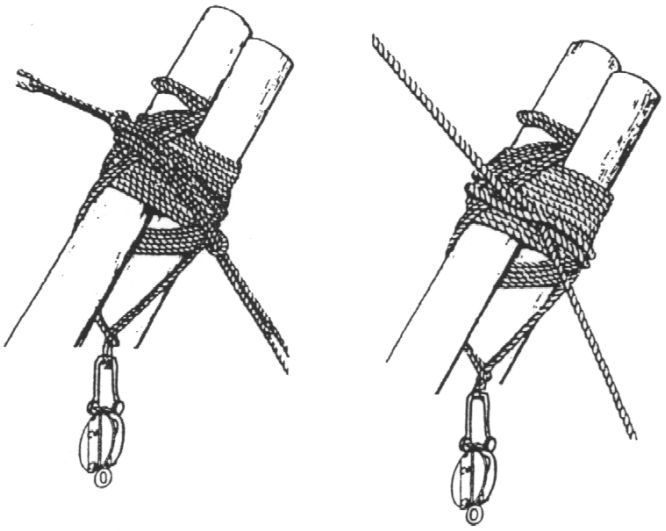
Passing the Head Lashing of Sheers



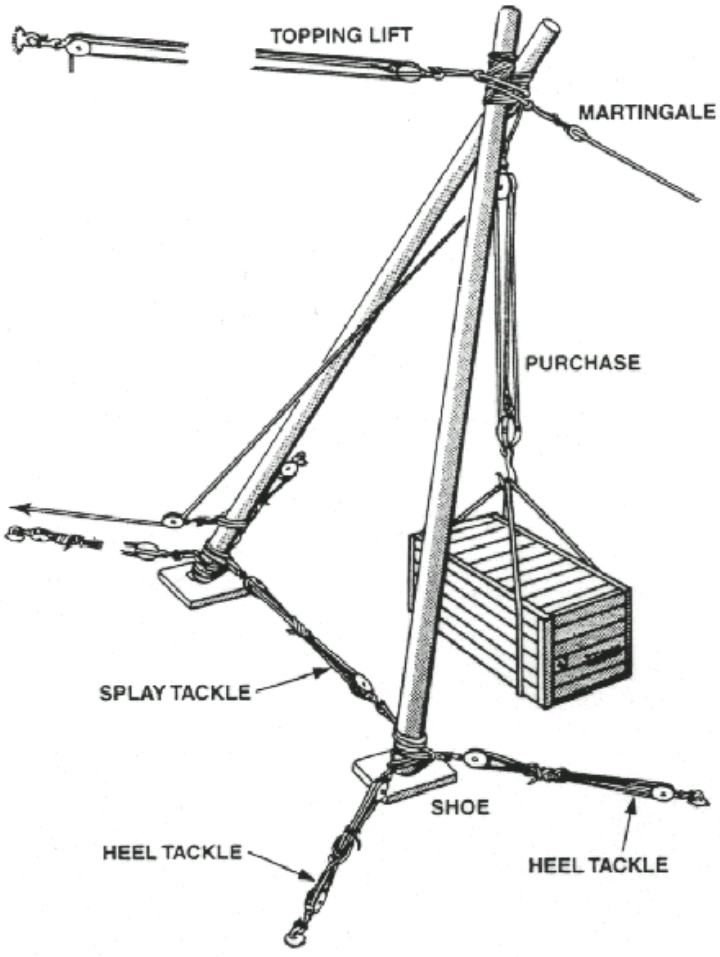


When the head lashing has been completed the heels of the legs are opened out to the required distance; the action of opening them out sets up the head lashing so taut that it binds the legs securely together where they cross. The strop for the purchase is now put on and must be long enough to enable the block to swing clear between the legs; it is applied by slipping it up to the top leg and passing it down over the head of the lower leg, so that it will bind the two together when under load. Chafing pieces (canvas, leather or other material) must be placed under the strop to prevent it chafing the lashing. The topping lift and martingale, or fore and back guys, are then secured to the head of the sheers. There are several equally good ways of doing this, each principle should have the pull on the guy assisting to bind the sheers together, and the purchase strop should be free to take up its natural position as the weight comes on it. The necessary tackles for the guys and other rigging is then secured in place. The sheers are placed in position, the heels in shoes, supported laterally by ***splay*** and ***heel tackles***. The distance between the shoes should be one-third of that from the foot of the sheers to the crutch, which is the effective length of the sheers. As its name implies, the ***splay tackle*** leads from the heel of one spar to the other, each end being secured to a strop. Two heel tackles are secured to each spar and as with the derrick, are kept as low as possible (rope collars may be tied on to prevent slippage). The leading block for the fall of the purchase is then attached to one leg. (An alternative means of splaying the legs is to lash a third spar across the heels. The heel tackle strops should be placed above the spar so that when under tension they lack against the spar).

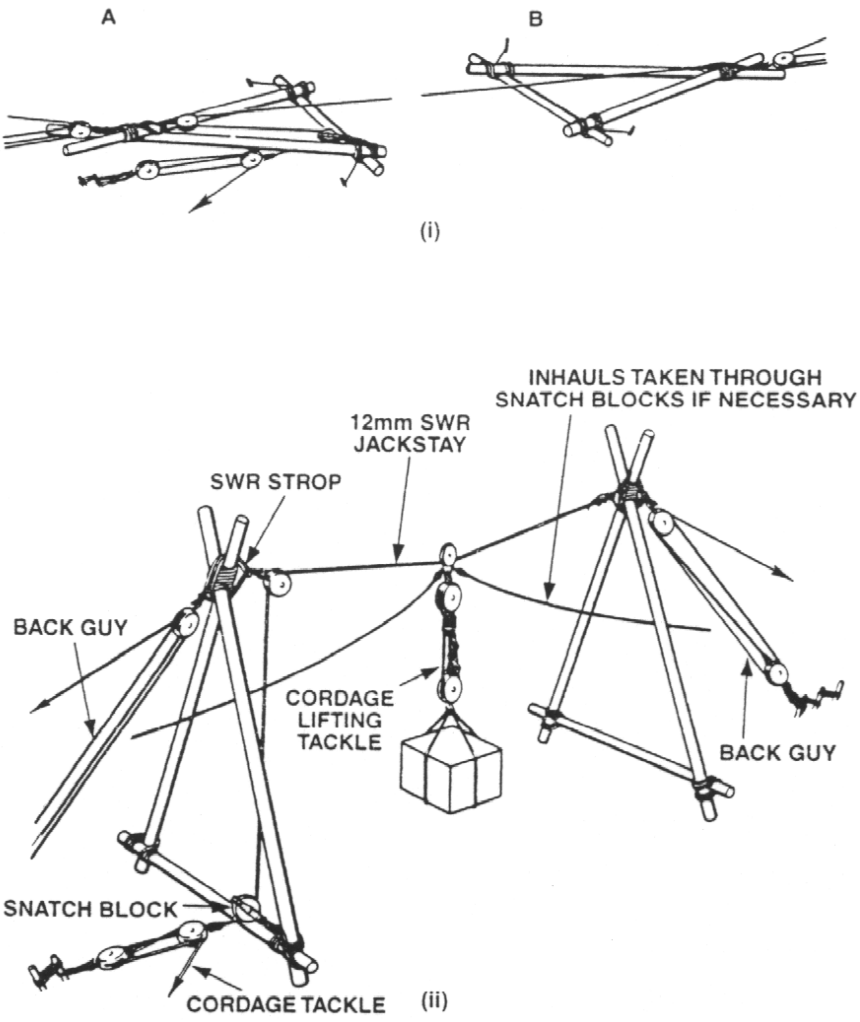
Methods of rigging the Heads of Sheers



Example of Sheers



Example of a Simple Jackstay Rigged with two Sheerlegs



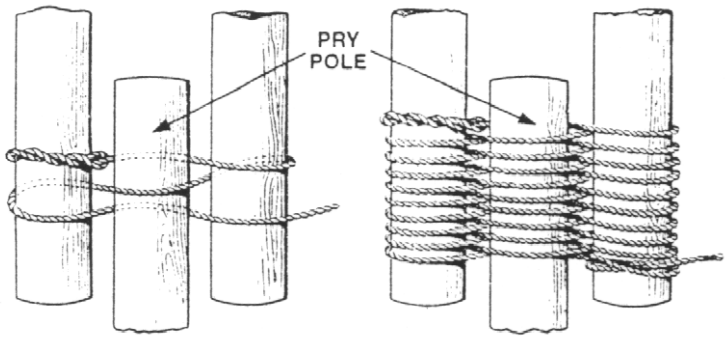
0512.4 Gyn

This consists of three spars with their heads crossed and lashed together and their heels splayed out to form a tripod. A gyn is stronger than sheers and derricks, and it requires no rigging to support it, but it can only be used for a straight lift.

To Rig a Gyn - The position for the head lashing is first marked on all three spars, which are to be used for the legs. These legs are then laid parallel with each other, about 50mm apart and with the heel of the centre leg pointing in the opposite direction to those of the other two. The centre spar is called the ***prypole*** and the other two the cheeks. The lashing is then put on by applying a timber hitch round one ***cheek***, then from six to eight figure-of eight turns are taken with the lashing being completed with a clove hitch round the other cheek.

Handy Hint: If all three poles are the same size and have smoothed surfaces, they can be lashed with all poles laying alongside each other - when the required length of lashing has been loosely applied the centre pole (prypole) can be slid out prior to tightening. This is an easier way of applying the head lashing.

Passing the Head Lashing of a Gyn

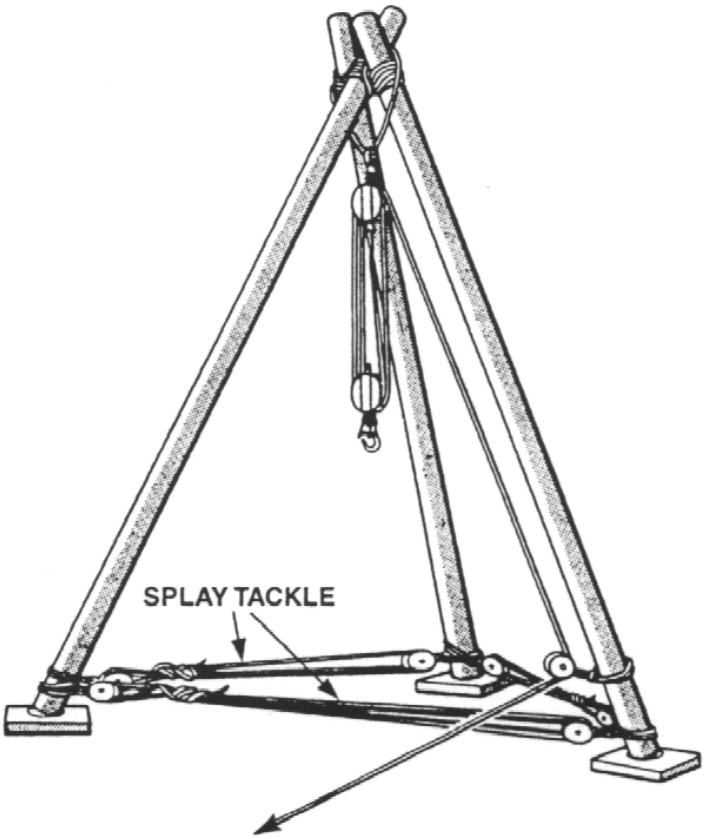


The lashing must be applied loosely; it cannot slip down once the gyn is erected, and if it is far too taut great difficulty will be experienced in raising the gyn. The heels of the cheeks are now opened out, and the splay tackles are rigged between the feet of each pair. The gyn is then raised by lifting its head and hauling the splay tackles taut. When the head of the gyn reaches a convenient height the strop for the upper block of the purchase is applied and the block secured on it. The heels of the poles should be set in shoes before finally securing the heel tackles.
An option to secure the heels of the poles could be the use of additional poles used as splay poles, securely lashed to the uprights, which will provide a firmly secured, freestanding gyn.
If it is necessary to secure the gyn down then additional heel tackles or lashings will be required.

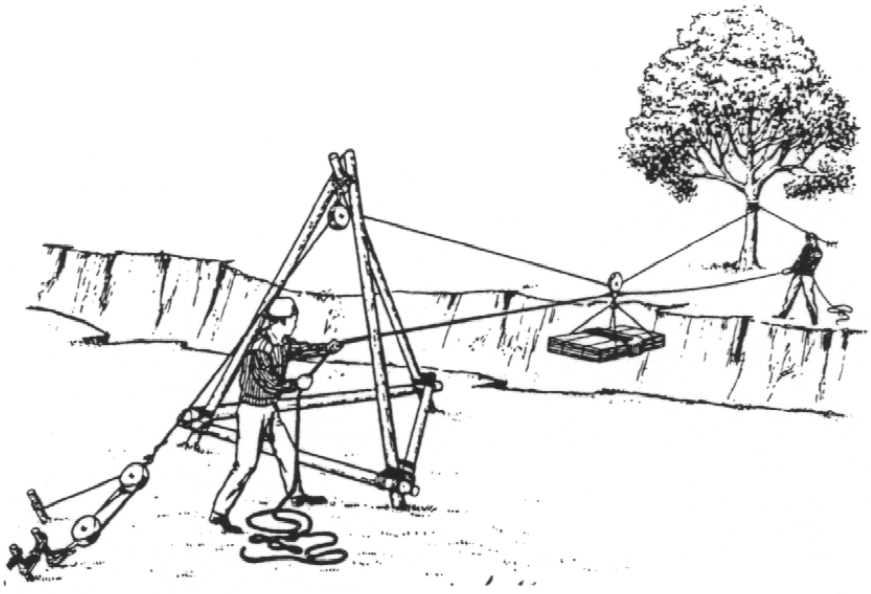
0512.5 Ropeways

Where no suitable trees or other fixing positions are available for supporting the jackstay of a ropeway, Gyns or sheers may be used. Gyns are preferable to sheers because they are more stable. The stresses set up in a jackstay are considerable and in practice can be taken as being five or six times the weight of the load. Strong holdfasts must therefore be applied for the jackstay or any back guys, and they should be placed so that the slope of the jackstay or guy from the ground to the head of the support is not steeper than one in four. The tauter the jackstay the greater the stresses imposed on its anchorages and supports, but the easier it will be to haul the load across. The jackstay can be rigged with each end secured to a holdfast and rove through a block slung from the head of each of its supports; or its standing end can be secured to the head of one support, which will then require a back guy. A traveller will be required to run along the jackstay and this may be a purpose built traveller or a single block. The gyn should have the heel of the prypole facing towards the gap to be traversed, but slightly to one side of the jackstay.

A Gyn

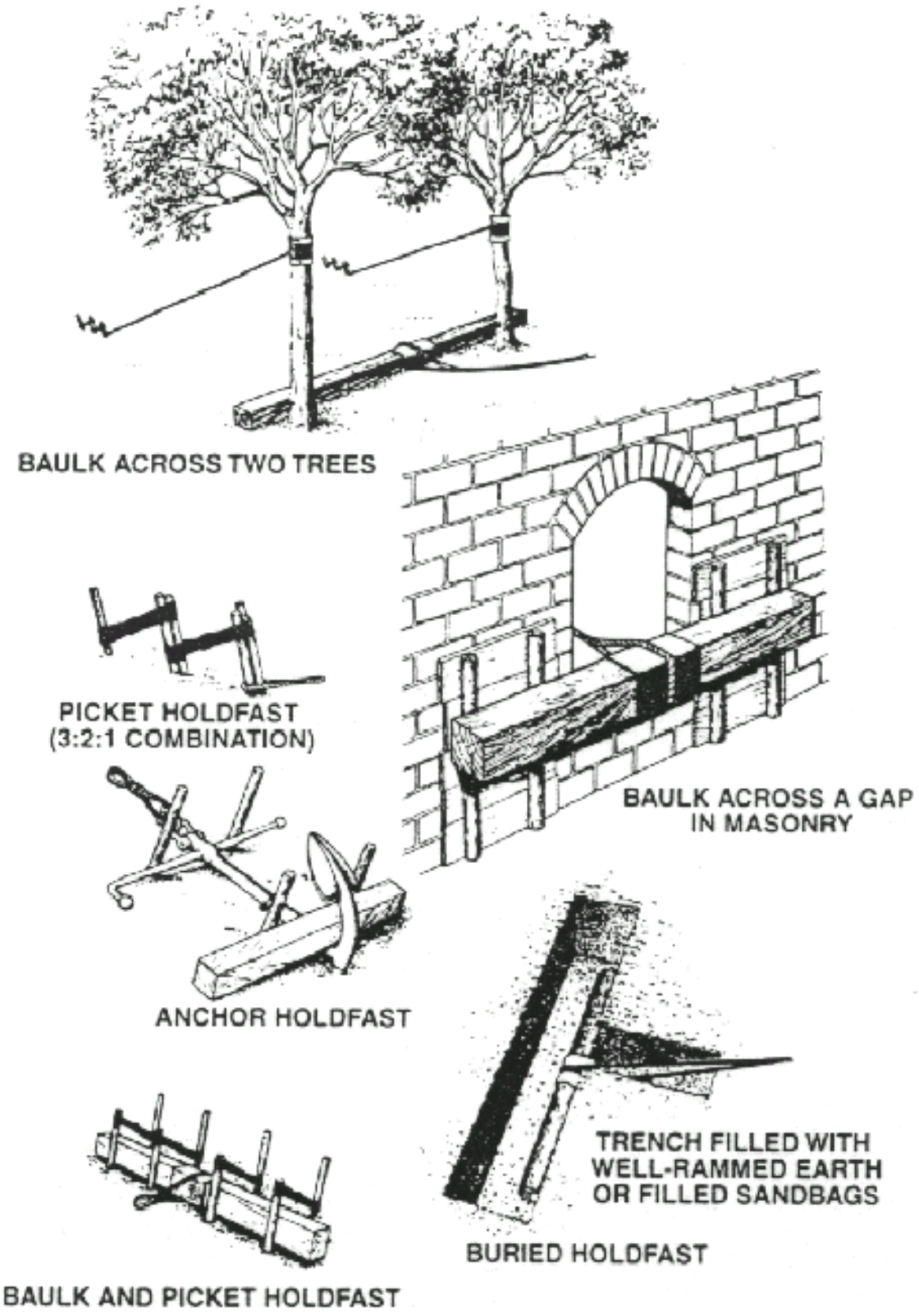


A Simple Ropeway



0512.6 Holdfasts

Examples of Holdfasts



0512.7 Temporary Marker Buoy

The Royal Navy's version of a Quick Release Marker Buoy is capable of being laid within 3 minutes. It is a quick, but temporary method of marking a location without the need to construct and lay a danbuoy.

It can be easily adapted for Sea Cadet activities without the requirement to have the correct marker buoy available. Any sealed container could be used as the buoy with a smaller container used as a pellet float. The weights may be any heavy object adapted to meet the need.