



By Artem Popov

SHIPS IN BOTTLES



Ships in bottles.

By Artem Popov

It is not a secret that mankind history inseparably connected with the sea. Since ancient times people overcoming fear have traveled across the seas and oceans. They were lead by insuperable thirst of adventures in search of the new. Nowadays we admire them, reading stories about the great geographical discoveries, brave seamen and pirates. What a courage a person should have to go to a storming ocean on a fragile little craft subjected to impacts of nature. And, of course, such a sailing cannot be compared with traveling in a cozy cabin of a modern super liner.

Not very many people know that ship modeling is a very old art. Archeologists found models of primitive boats even on a site of an ancient civilization, they were children's toys. Models of vessels also were used for various worships — they were put in tombs to make the transition of a dead person into another world easier. Fine gold and silver ship models were found in Mesopotamia and the Egyptian Valley of The Kings. In general, the history of ship modeling totals not one thousand years.

Speaking about ships in bottles, this art is considered to appear in Europe in 17-18 centuries. The models that can be found in some European museums can be dated to those times. Seamen whiled away the time on the shore drinking alcohol from bottles and therefore one of them had an idea to put a small ship inside one. Could have ship models appeared before the mentioned times ? Most researches thought it was impossible as ancient glassblowers were not able to make transparent glass to easily see the contents. Anyone could hardly want to put models into lightproof bottles. However some new data show the opposite: we can see transparent glasses and vessels on old paintings. Is it a master's fantasy or a reflection of reality? Archeologists found fragments of broken glass more often which age is thousands if years. In old times glass was very expensive and difficult for poor people to buy. Yet we can not exclude the possibility that a talented master could put a ship model inside any of those bottles.

Besides ships masters created religious scenes, scenes from everyday life, various mechanisms and other things. This kind of art might have appeared earlier than ships in bottles. But the term "ships in bottles" should include everything that can be created in a bottle through its narrow bottleneck.

As a rule, models in bottles are divided into 3 principal groups:

Ships in bottles

There is just a ship model in the bottle. Attention in such models is paid to accurate reproduction of the details. The model inside the bottle can lie on a special stand or glide on the sea surface made by a/the master.



SHIPS IN BOTTLES

Diorama

Dioramas show scenes from life, often nautical. It can be a huge port with a big city on the shore and ships in the roads, sea battles, a sinking vessel and others.

Unusual things

This group covers everything that a master's rich imagination can create. It can be religious scenes, mills, mechanisms, statuettes, cars, planes, that is all that can not be named "a ship".

In spite of industry developing ship models are still handmade and they still amaze us; besides it is an art that requires much patience and skill. Many people are fond of ship modeling nowadays using modern materials and constantly inventing new methods of fitting.

In such countries as England, Germany, Holland, Denmark, Norway, France, Japan, USA and some other there are associations that unite people interested in ship modeling. There exists even the European Association of Ships in Bottles with members from all over the world. These organizations publish magazines, arrange exhibitions and conferences making the life of its members more interesting. There are also a lot of museums where you can see ships in bottles.

This book is probably the first one to reveal the secrets of creating ships in bottles. You will find an answer to that torturing question "How?" The book tells you about various methods of fitting, gives you recommendations about making small details of a ship and reveals the secrets of cork puzzles. A great number of pictures and illustrations will help you to get a deeper understanding of the process. This book will be interesting for both beginners and experienced masters and everybody will find something interesting in it.

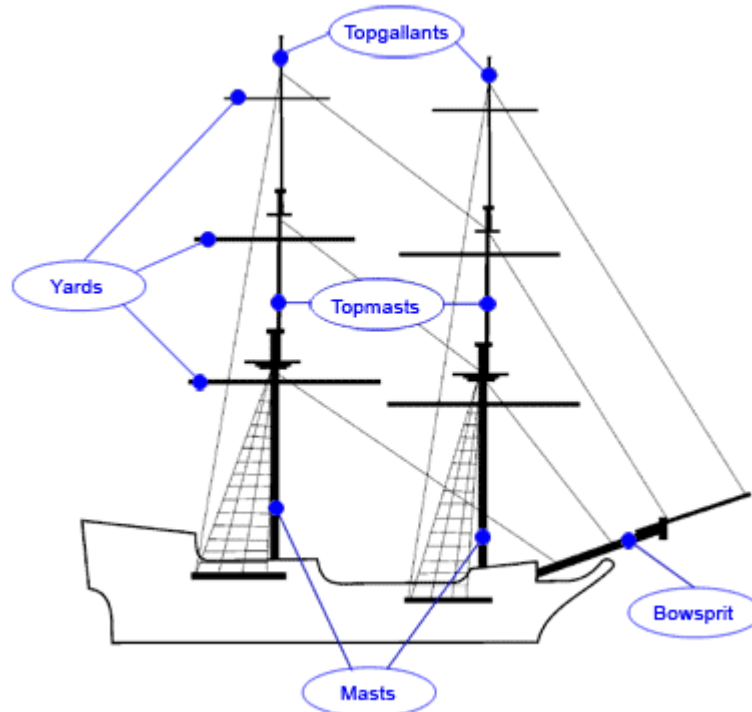
How to put a ship into a bottle?

Some details of a sailing ship.

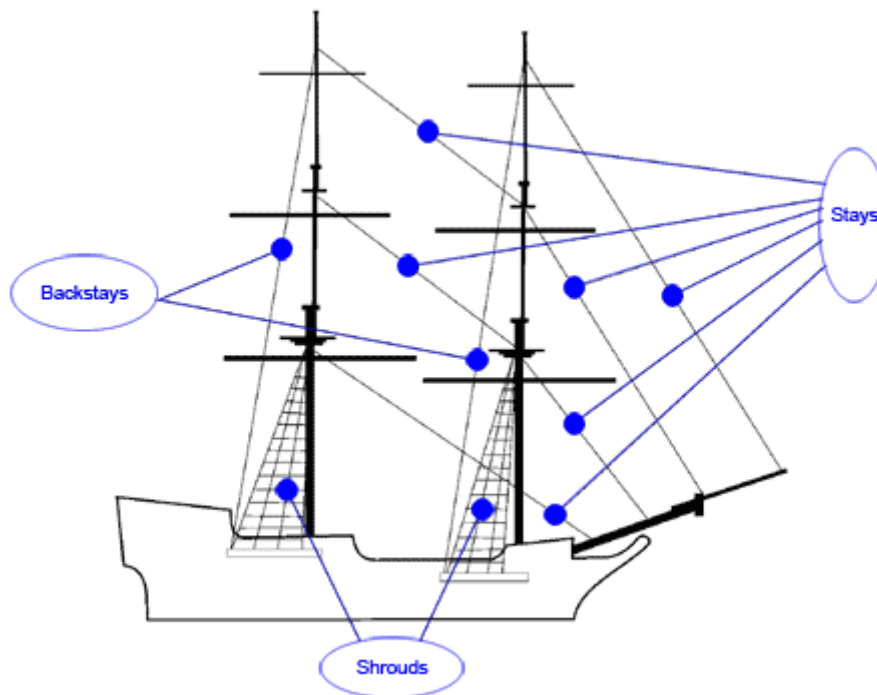
Before proceeding, let me explain you the functions of certain tacking of a sailing vessel. You might think that a ship is wrapped up in useless web of ropes, cables and cords, but it only seems so. Its structure was brought to perfection by masters during hundreds of years. It is hard to believe that in the rigging of a ship there is no unnecessary rope or detail. Each rope plays its own role and has its own name. We are going to tackle those ones that you will often meet in this book, but if you come across some unknown names, we advise you to look it up in a dictionary.

SHIPS IN BOTTLES

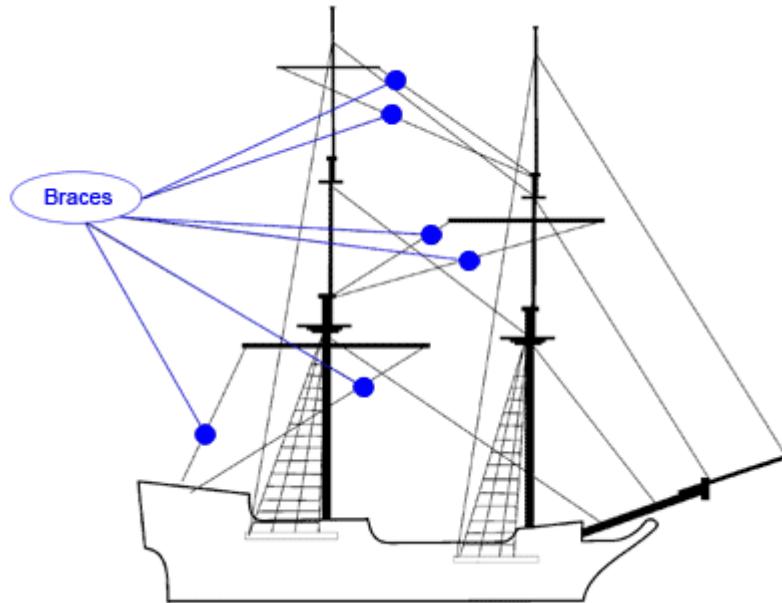
A sailing vessel has **spars** (pic. 1) and **rigging**. Rigging can be **standing** (pic. 2a) and **running** (pic. 2b). There are much more details but those particular ones make it hard to insert a ship into the bottle, though sometimes they vice versa help you do that.



Pic. 1 Spars of a sailing vessel



Pic. 2a – Standing rigging



Pic. 2b – Running rigging

Methods of putting a ship into a bottle.

Every craft has its secrets; ship modeling masters have them as well. The major one is how a ship gets into a bottle with a narrow bottleneck. Uninitiated may have fantastic ideas from a bottle cracked into two halves and then glued together to a team of ants assembling a ship inside a bottle under the careful guidance of their master. We should reassure you: everything is done honestly and a ship is inserted into a bottle through a narrow bottleneck.

An interesting fact is that there are quite a few ways of putting a vessel into a bottle, and every master adds so much new to a traditional method that it becomes a secret.

What is good in this or that technique? It depends on your experience, skills and patience. One of them does not require complicated manipulations when assembling a model inside a bottle, but limits you in choosing a ship structure without giving you a possibility of working with complex models. The other, vice versa, allows you to choose any model though making assembling inside a bottle more difficult.

We are going to describe a few methods of assembling of a sailing ship; it will allow any reader, even a beginner, choose a good one.

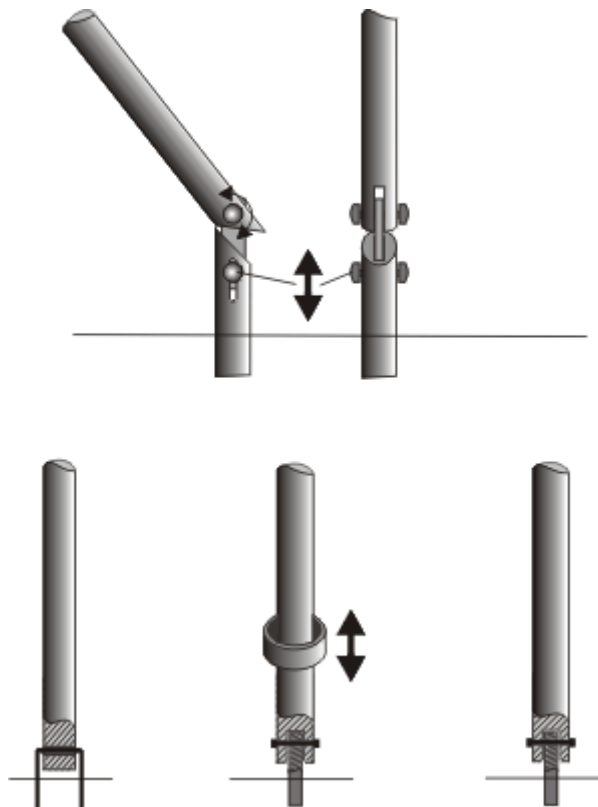
Method 1. Traditional.

SHIPS IN BOTTLES

This method is the most widespread among ship models masters; it does not require complicated instruments and skills. The only thing you will need is patience and carefulness. The best way to start is to make a body – it is made of wood, then painted in a desired color and after that a mast, spars, rigging and other details should be installed. Do not be frightened: all those details are assembled on the table, not inside the bottle. You only need to make sure that the construction will go through the bottle neck easily.

Making a body is a very important part of your work. In spite of the fact that the body should be narrower than it is shown on your drawing (to make it easy to insert it into a bottle), the rest of the parts should be possibly made according to the drawing. Only following these instructions you can make a good model.

Now let us proceed to the masts because they contain the very secret of the work. They have a tiny joint in the base which allow them to bend easily along the body of the ship. There exist a lot of joint types but before choosing one try to invent your own. You might contrive something special – a thin spring, a plastic tube or something else can become a joint, too. (pict. 3)



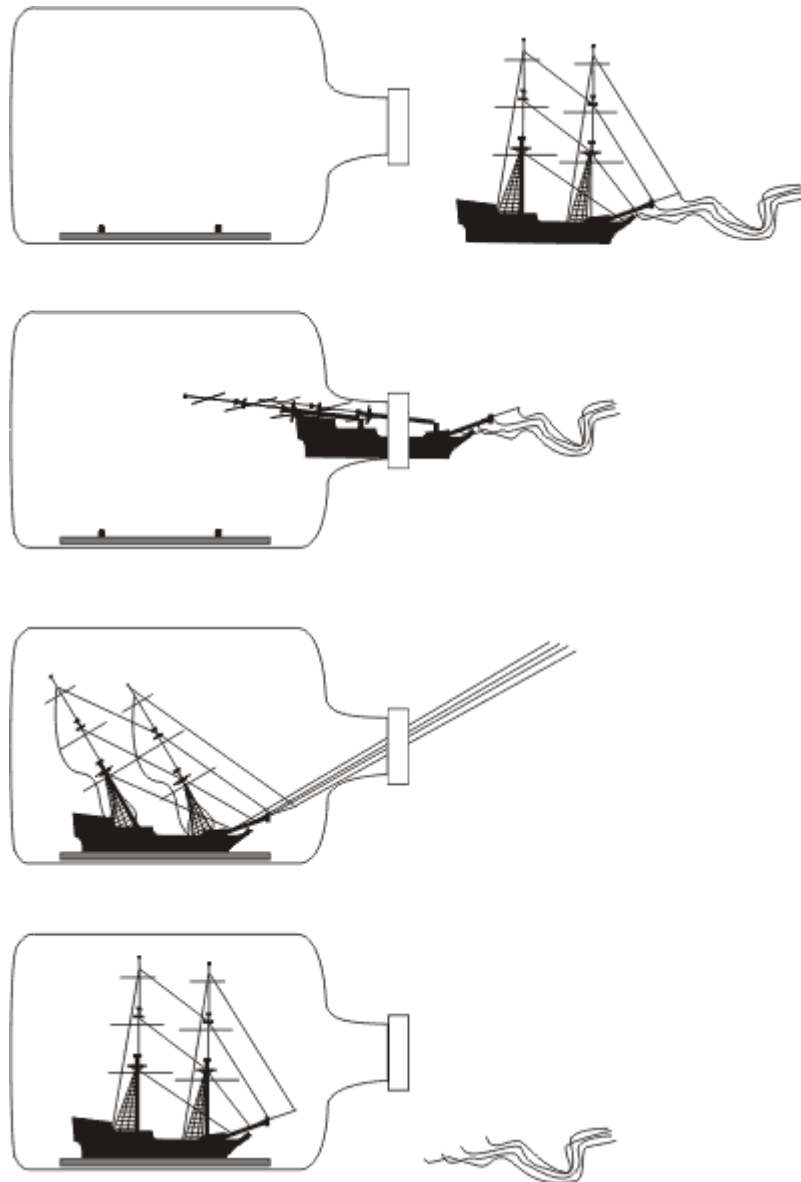
Pict.3 There exist a lot of joint types.

The only thing you need to remember about is that the joint should be as less noticeable as possible, that is why you need to find a way to make that joint hidden. You can paint both the joint and the mast in dark color or put a piece of tube on the mast which will cover the joint when the mast is in vertical position, and there is a lot of other ways to do that.

SHIPS IN BOTTLES

After installing the masts the shrouds and backstays are installed. Now you can see that a ship with the masts folded down can be easily inserted into the bottle. However, if you fix the stays hard, it will prevent the masts to fold back. To avoid that, the bottom of the stays should not be glued completely or cut but should be left long and after being run through a special opening (on the bowsprit or deck) should be taken outside the bottle.

Of course, the stays should be long enough to make the masts vertical (pic. 4). These strings will be cut off at the end of the work, but before that you need to fix them with a bit of glue.



Pict.4 You can adjust the mast in a vertical position by pulling the string.

Do not forget about the sails, and before putting the ship into the bottle you need to attach them as well as the yard, brace, sheet and the rest of the running rigging. As a beginner, you can choose a simple schooner with fore-and-aft sails for your first work. Then installing of the sails and assembling of the ship inside the bottle will not cause any difficulties. Sailing ships with a large

SHIPS IN BOTTLES

number of goosewing (square-rigged ship) may be more complicated to make. In this case you should probably use the method described above: run some details of the running rigging through an opening in the body and pull them out (the described method of assembling a ship inside the bottle works here as well).

After all the ropes are drawn and fixed with glue, the unnecessary threads should be cut off.

The model is almost ready. We only need to mention how to attach a ship inside the bottle. Most masters like making a model of sea surface inside by pouring colored epoxy resin or imitate waves using various plastic materials. Such a “sea” allows you to make the body of the ship only up to the waterline which makes its measurements smaller and makes the penetration into the bottle easier.

However, when building a ship model, especially a modern one, it is important to display the bottom of it. You need to put the ship onto a stand glued to the inside part of the bottle. The simplest way to do that is to use a small wooden board with tiny pins for fixing the ship.

As you can see, the secret turned out to be quite simple. Now let us assess advantages and disadvantages of this method of assembling of a ship in a bottle. The major advantage is the simplicity – the model is assembled at the table which does not require complicated manipulations inside the bottle. However, it results in a few drawbacks. In fact, restrictions put on the width of the ship body can prevent you from building an exact model shown on your drawing since the body with the rigging should easily go through the neck of the bottle. Building a model with multiple sails and complicated construction of the body will not be simple either because the neck of a bottle is not wide enough. It is also impossible to make a body consisting of two or more parts. All that gives a lot of trouble though using the traditional method will help you make a good model.

Now I am going to tell you about the instrument with which we assemble a ship inside a bottle. I should warn you against using long tweezers (if you already have ones, hide it), or you will never overcome that psychological barrier and invent something new. You should not use an all-purpose tool either; for every action there should be a certain instrument.

If you decide to use the method described above, you will need the simplest devices only. Let us enumerate steps to assemble a ship in the bottle. First of all, glue the stand to the glass. Then push the ship into the bottle, put it on the stand, straighten the sails and stretch the rigging. The last step will be to remove unnecessary threads. For each step you will need a separate instrument.

All of them you can easily make from umbrella spokes. To make a spatula for glue, just flatten and turn down the end of a spoke (pic. 5).

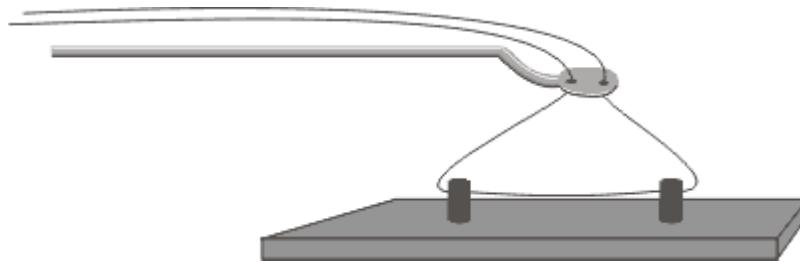


Pict.5



SHIPS IN BOTTLES

You can use a similar device to put a stand inside the bottle, but you need to make two holes in the spatula so that it will look like a crane. Make two holes in the stand as well to hang it up using a piece of fishing line. After installing it inside the bottle pull out the fishing line (pic. 6).



Pict.6

The next instrument will help you to do the most part of work inside the bottle. Sharpen and turn down one end of a spoke and attach a piece of flexible but firm wire to the other (pic. 7).



Pict.7

The last instrument will be used for cutting off unnecessary threads (pic. 8), attach a piece of wire and then a razor. Flexible wire allows you to change angles and cut off threads in hard-to-reach places. For attaching the razor you can use hot-melt adhesive glue. This glue melts fast when heated and becomes hard quickly when cooled down. Because of such properties of the glue you can replace blunt razor in seconds.



Pict.8

If you just start working on your model, it would be practical to use the above described instrument. And during your work you will improve it and get some new skills.

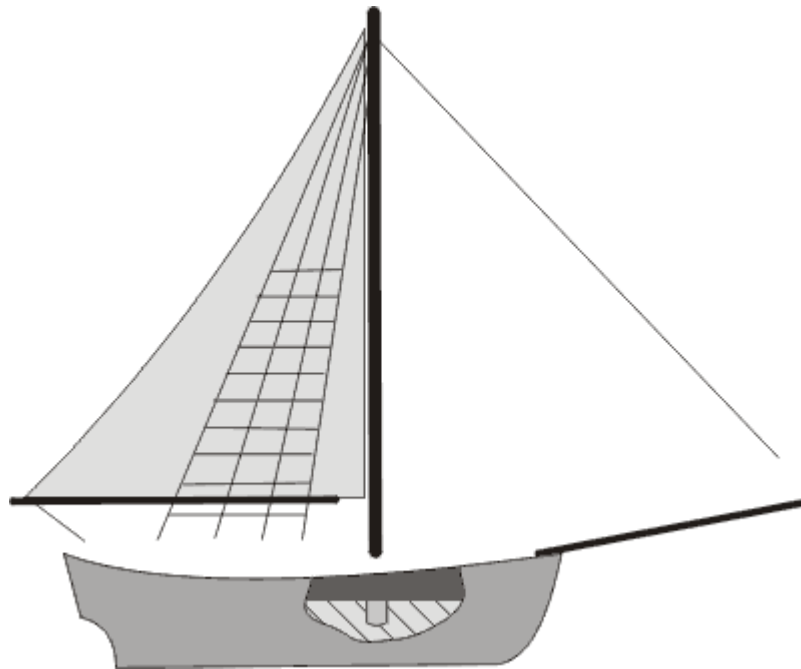
The first method of assembling of a ship in a bottle can be recommended for beginners while an experienced master will not find here anything new. Although I dare to believe that even a skilful person will get some interesting information after reading this book.

Method 2. Straws.

SHIPS IN BOTTLES

I already mentioned that the body of a ship can consist of a few parts. To make a more interesting model you can cut a wide body lengthwise and join them inside the bottle. The traditional method does not allow that, that is why there is another method called "straws" which, being complicated, is widely spread among model makers. You do not need to make a joint and put stays through the bowsprit, neither cut off unnecessary threads. The secret is in something else.

The body is inserted inside a bottle separately, and after that rigging, sails and masts are installed. It is possible because all the threads of the rigging are hard like straws, they do not rumple and do not need stretching; you should only glue them to the body (pic. 9). People can not touch a ship inside a bottle so they will never discover our secret: all the materials will seem to be made of real soft threads.



Pict.9

Before work you will need to prepare enough amount of hard threads (just soak them in glue and let dry). Then cut off a thread of a necessary length and attach it to a mast or a yard. However, when building your model on the table, you should remember that shrouds, backstays, stays, braces and other rigging should be attached with only one end to the masts, yards etc. All the threads should be glued to the body only inside the bottle. Because they are tough, they will keep the shape you want. After placing the masts into designated space, you will only need to glue all the thread ends to the body, already inside the bottle.

Before putting the model into a bottle, you need to adjust all the details and make sure that they can be put through a bottle neck without being damaged. It will make assembling easier and save you troubles.

A body can consist of a few parts; each of them should go through the bottle neck easily (I will describe below how to make such a body.)

SHIPS IN BOTTLES

After installing the body onto a stand the masts should be attached one by one and the ends of the rigging glued to the body. Yards and sails are usually already attached to the mast, so they are put into the bottle together.

Although if a model has lots of goosewing s, it can cause difficulties because it might not go through a bottle neck. To fix that problem, you can make them more movable – glue clew of the sails to yard end inside the bottle. The yards and sails tied to the mast with luffing cable can easily come through the bottle neck. There is another method. Glue a tiny hook made of wire (or make little burrs on wooden masts) to the spot where luffing cable is attached. Put the masts into the bottle, install them on the body and hang the sails on the hooks. Step by step you will assemble the whole model.

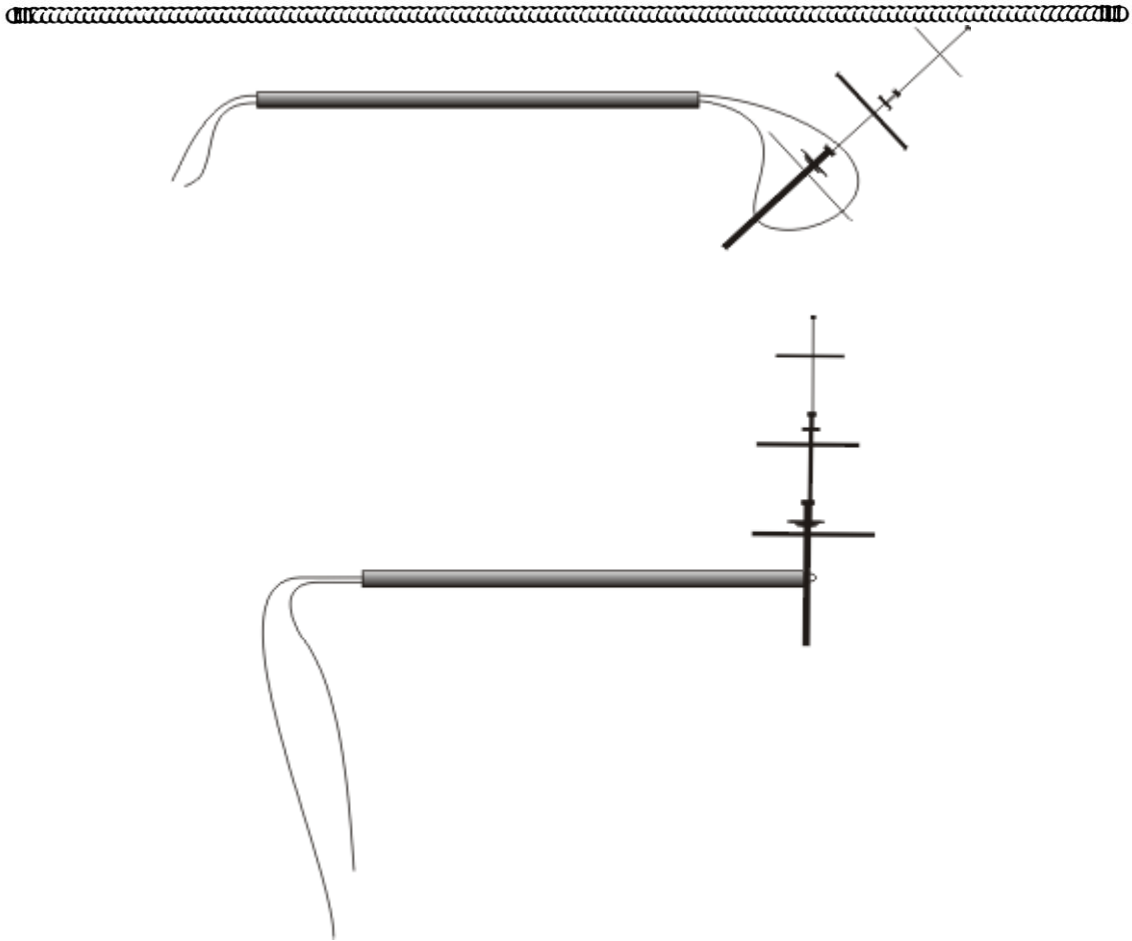
Of course, it takes more time to assemble the model inside than when you use the first method, but the result justifies the efforts.

Let me assess the advantages of this method. If we compare the first and the second methods, we will see that the second one is much more complicated though it has higher potential. The body can be much wider than a bottle neck which is highly valued by model makers. It became possible because of separated assembling of the masts and sails with rigging: you can assemble the body inside the bottle and then attach the masts and the rest of the rigging.

There are also some disadvantages. Because the entire rigging is attached to the body inside the bottle it is rather hard to imitate such details as chainwales, hounds and deadeye.

This method requires a more complicated instrument though even now you can do without long tweezers. You can mostly use the instrument described in the first method, add only a simple device for installing a mast (pic. 10). It is a long stick with a piece of fishing line inside folded in two. Throw a loop on the mast, push into a bottle, draw the fishing line, and you will be able to install the mast into a desired place. Then pull one end of the fishing line to release the snap.

SHIPS IN BOTTLES



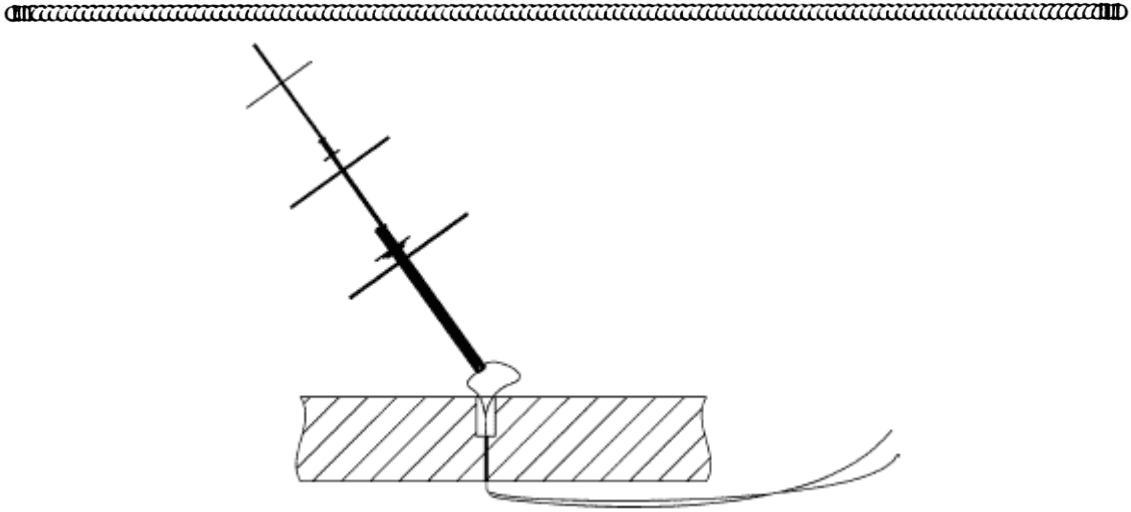
Pict.10

Of course, if you want to make more complicated models with lots of details, you will need a more complicated instrument which I will describe later.

Method 3. Without a joint.

To make this book more interesting, I am going to switch from simple to complicated and vice versa. Let's go back to the first method and try to get rid of the joint at the bottom of the mast keeping it simple and fine. As you noticed, it's the structure of a mast that contains the secret of any assembling method, and this one is no exception. The mast has no joint at all; it is pulled into an opening in the body with the help of a fishing line. The hull should be made of wood; drill a tiny (0,5 – 1 mm) reach-through hole in the socket for the mast; it will be used for the fishing line. Make a hole in the bottom of the mast, run the fishing line through the hole in the mast, then through the reach-through hole in the body and take it out. After that you can pull the fishing line and that will put the mast into vertical position. Glue the mast to the body and take the fishing line out (pic. 11).

SHIPS IN BOTTLES



Pict.11

The rigging is attached in the same way as it was described in the first method: glue shrouds and backstays to the body and pull the stays into openings in the bowsprit. Don't forget to get rid of excessive threads.

This method allows you to maneuver and, if you use various ways of assembling, you can get unexpected results.

Before I start describing the most interesting and at the same time complicated and time-taking assembling method, let me surprise you with a ridiculously simple yet original method. Imagine a ready model of a ship. All the anchors ropes and stays are attached, the unnecessary threads are cut off, and there are no joints and threads sticking out. A few simple actions and the model is inside the bottle in the same condition. Was it a joke? No. Just have a look at the next chapter.

Method 4. A Joke?

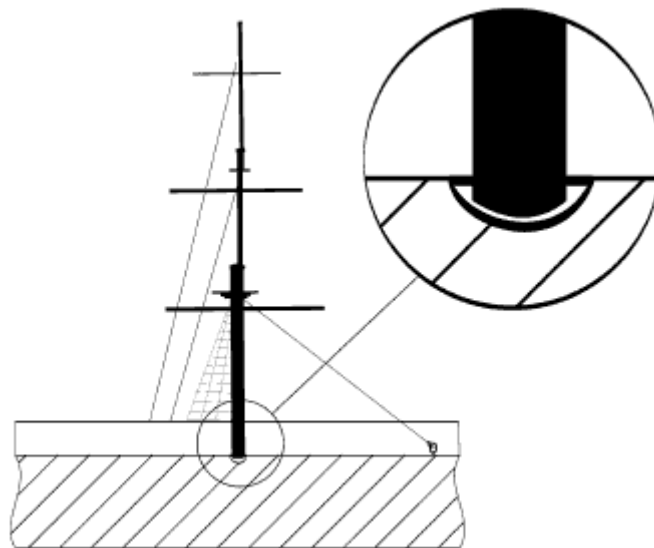


SHIPS IN BOTTLES

Models made with the help of the method "A joke"

When you find out the secret of this method, you will exclaim "How easy!" But what is most surprising is that this method is hardly used in ship modeling, probably because of its simplicity it is often neglected. The secret is really uncomplicated: the mast is installed not in the opening on the body, but in a shallow hole. Such an installation will allow you to move the base/bottom of the mast and then put it back when it is inside. As you already understood, the whole rigging is attached on the table outside the bottle. Then the base/bottom of the mast should be carefully moved and the mast is laid along the body. Now you can insert the model into the bottle. After fixing the model inside the bottle, all you will need to do is to install the masts in those shallow holes, and the model is ready! On the pictures you can see models made with the help of this method.

This example explains you why most of the time it is a sailing ship that is inserted into a bottle. A sailing vessel has a certain structure that allows stretched shrouds and stays not only hold the mast in place but also (in this particular case) set it in a vertical position. If we start moving the mast base, it will become vertical. At the end you can glue the mast to the body to make it stable (pic. 12)

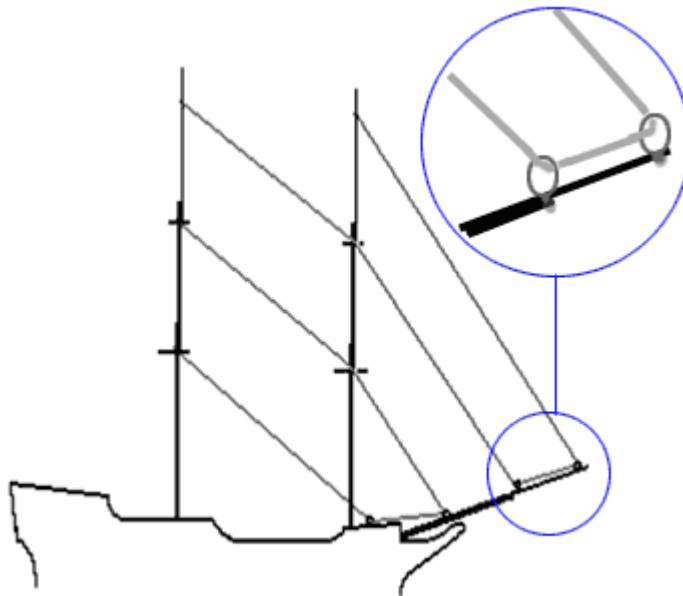


Pict. 12. The mast is installed not in the opening on the body, but in a shallow hole.

This method may be perfectly used for working with such small models as schooner, brig, or brigantine. But if we take more complicated ship, we are going to face some problems (I already described them in the chapters above). When trying to fold the masts, the main obstacle you can face might be a way of putting the stays through the structure. Topmast stay or topgallant stay often prevent you from laying the masts along the side of a ship. But you can solve this by solving an engineer problem. A possible decision is to slidable mainstays. (pic. 13). Main topmast stays easily goes through an opening in the top of the foremast, and then after going through two loops in the

SHIPS IN BOTTLES

bowsprit comes back to the foremast already as a mainstay. You can use this way to put any pieces of rigging through.



Pict. 13. Slidable mainstays.

You can also use combination of above described methods, for example, make one or two stays long (as in the first method) and put them through an opening on the bowsprit and then through the bottle neck.

Besides being simple, this method allows you to deal with only two or three threads instead of a whole pile of them.

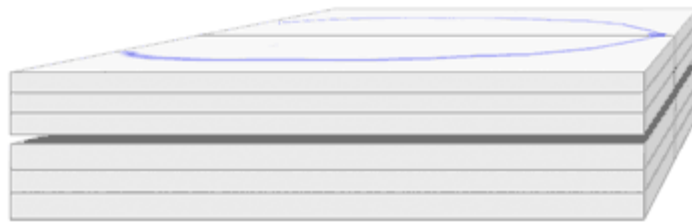
Method 5. Great potential.

A ship in a bottle is not just a model of a sailing ship or a souvenir; it is a brainteaser which was made to puzzle people and delight them. A spectator should ask you: "How did you do that?"; and the more difficult it will be for him or her to find an answer, the more interest it will arouse.

This assembling method is the most interesting and unusual yet the most difficult and time-taking one. It gives you truly unlimited potential. Is it possible to thread a needle inside the bottle? Yes, this method will allow you to do that easily. After learning it, you can start making even the most complicated models. Though you will need a lot of patience, attention, and knack to achieve your goal.

Body.

Let's start with the body. To make a model spectacular and mysterious, you should make the body as wide as possible. People shouldn't have any doubts that the body is bigger than the bottleneck. For that sake it is useful to make the body even wider than it is shown in your drawing. It is even better to choose a model with round-bellied body. Of course, you will have to assemble such a model by piecemeal since only separate details can come through a bottleneck. Before you start, get some slats with thickness 2-2,5 mm. You can easily find different objects that you can use for this purpose, for instance thin veneer sheets. Glued together, they perfectly imitate ship's skin. You need to make a brick gluing them to each other and marking a cutting line. This line should divide the body in horizontal plane around waterline level (pic. 14). The body will be cut vertically later.



Pict. 14. A brick – a work piece for a future model.

When cutting the line, try to make it as less visible as possible on the ready model. It'll be perfect if you overlap the line with the waterline and even better if it is covered with rubbing strake.

After estimating the thickness of the upper and the lower parts of the body and getting a necessary amount of slats, start gluing bricks together. This is a very important part because if you do that carelessly, the patch spot will very noticeable.

The slats for the upper and the lower parts of the body are glued and made into bricks separately; you will get two work pieces with the widths of the upper and the lower parts of the body. Don't let the glue dry up and put the upper and the lower parts together squeezing them with a screw clamp. Don't let the glue get into the gaps between the parts. The work piece should be completely dry before you can take the loading off. Otherwise (especially if made of thin veneer sheets) it can cast any moment and spoil the whole thing.

If you do everything correctly, after you take off the screw clamp, you will get two halves of the body fitting each other perfectly. I want to emphasize the importance of that as it will allow you to make the patch spot invisible.

While working on your model, keep it away from uneven heat (such as sun or oven) because it can cause casting or even lead to gaps on the body.

SHIPS IN BOTTLES

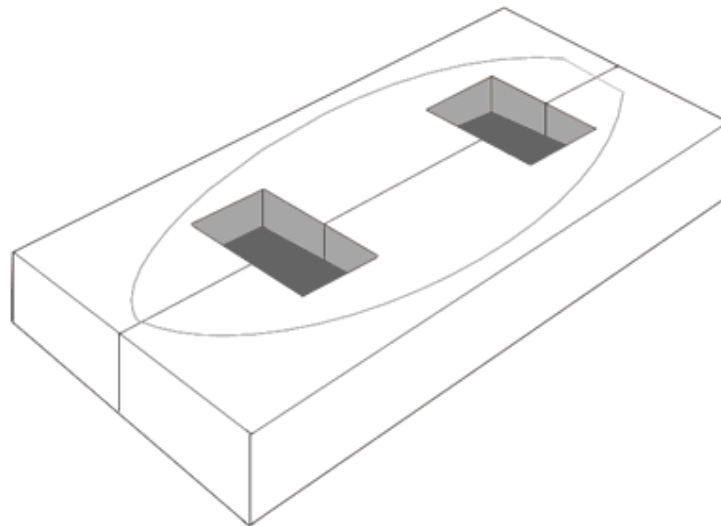
Now you have the upper and the lower parts of the body but....they won't go through a bottle neck even separately. You need to cut the work pieces vertically, but don't rush to do that. I'm going to tell you how all four parts will be joined together.

To prevent them from falling apart, you need to join them so that the upper part holds the lower part and the right part holds the left part. You can find the scheme on pictures 15 – 19. The main point of it is that the left lower part holds the upper right part and the right lower – the upper left part.

Moreover, the upper and the lower parts are joined together for more strength. Such a joint though seems complicated holds all the parts together and allows you to work on the model without any trouble. The parts are fixed with little pins which should be made of steel. In that way you will avoid expanding of wooden pins after contacting with glue. Besides getting bigger, there is another problem. Some kinds of glue can leave a thick joint which can lead to a visible gap between the parts of the body; epoxy adhesive (liquid) is probably the best choice for that.

I can recommend the following scheme of making a model:

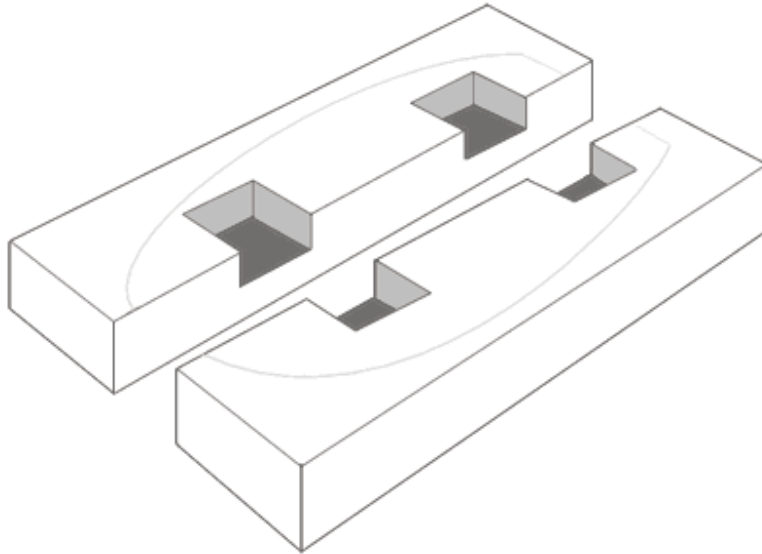
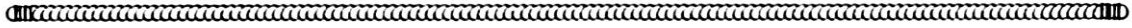
1) Draw the outline of the model on the lower part of the work piece according to your working drawing, then cut out slots for inserts (pic. 15).



Pict. 15.

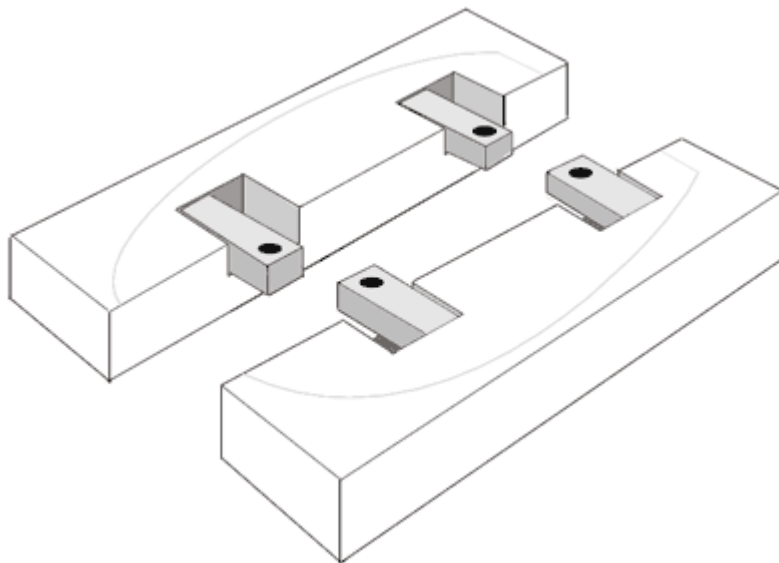
2) Cut the lower part axially (pic. 16).

SHIPS IN BOTTLES



Pict. 16.

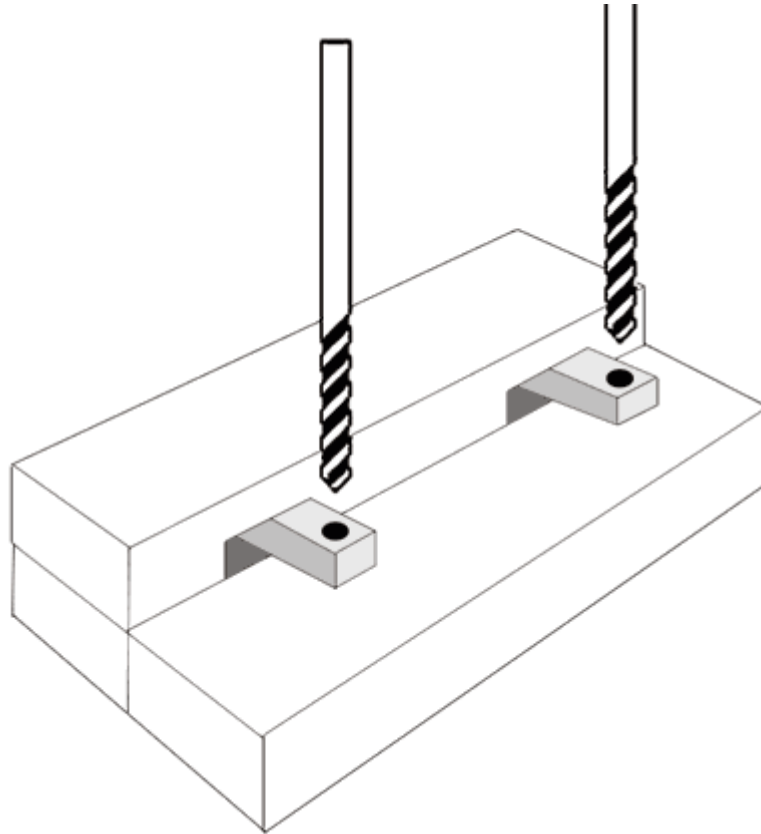
3) Stick on the inserts , then drill a hole in them for main pins (pic. 17)



Pict. 17.

4) Drill through holes in the upper part (without cutting it) for additional pins to join the upper and the lower parts. Join the parts together and using one of those holes as a guiding one drill another hole in the lower part for an additional pin (pic. 18).

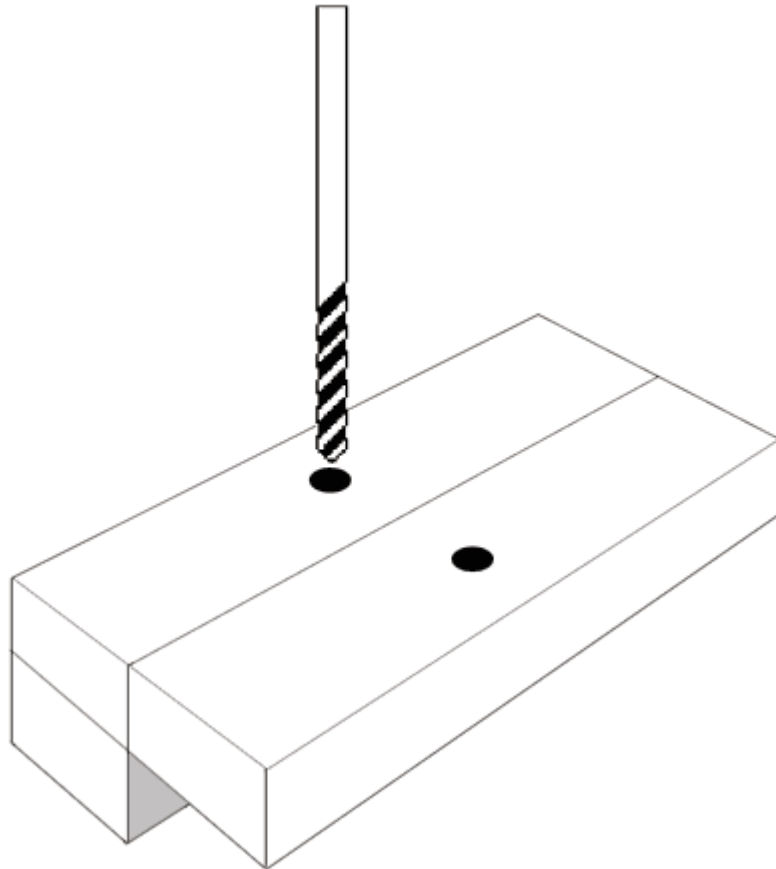
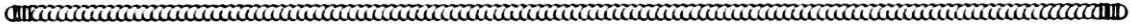
SHIPS IN BOTTLES



Pict. 18.

5) Insert an additional pin from one side, put the parts together and turn them over, then mark holes for the main pins (pic. 19).

SHIPS IN BOTTLES



Pict. 19.

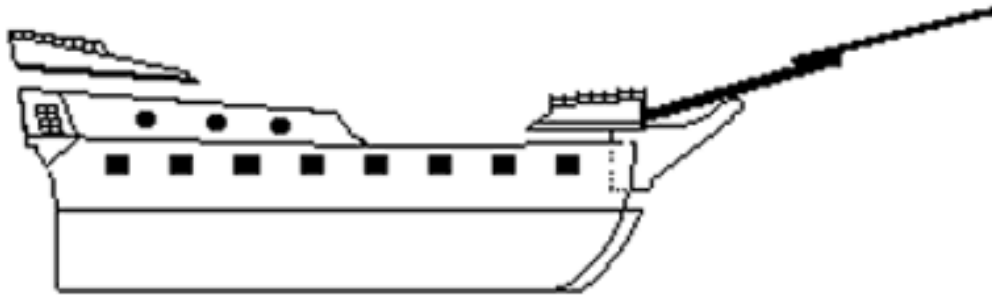
6) After inserting the main pins into one side, repeat all the above with the other side.

7) After this rough work , cut the upper part axially.

You can work out a different work order, but it is better to work on a model without cutting the upper part. It will make your work piece harder and your work easier. While working you'll probably appreciate the advantage of using thin veneer sheets as they not only imitate ship's skin and make all the parts match, but also helps you make marks because the body already has all the lines.

Old sailing vessels dated XV-XVII centuries had tall and beautifully decorated superstructures; that's why you'd better make their bodies using five or six parts, not only four. Not only are both the lower and the upper parts put separately, but also some of the details of the fore part and after part superstructures. It's a good idea to make a part of the foredeck removable together with the latrine and bowsprit and a part of the after part superstructure. The whole rigging should look like a unit. Choose cutting line where run rubbing strake , in this case rubbing strake glued to the joint will completely cover the cut (pic. 20)

SHIPS IN BOTTLES



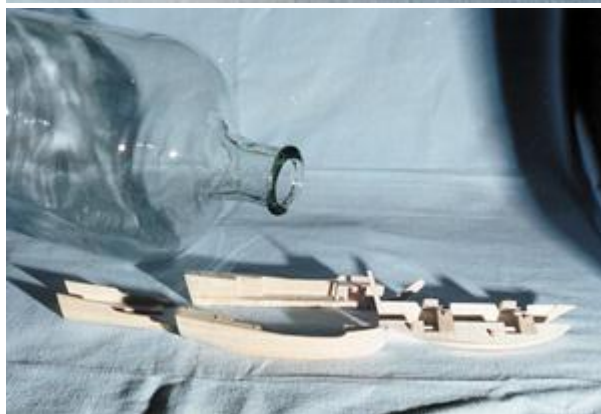
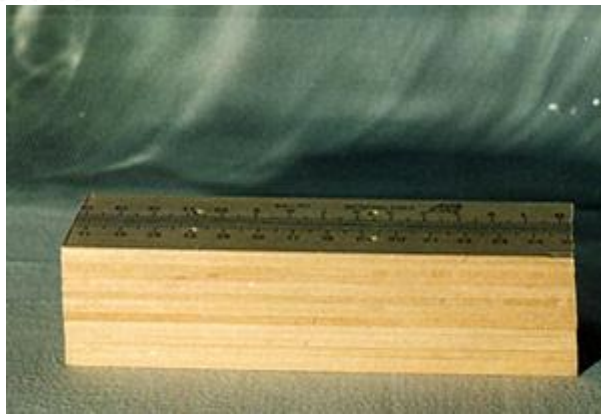
Pict. 20. It's a good idea to make a part of the foredeck removable together with the latrine and bowsprit and a part of the after part superstructure). It will be harder to hide the cut on the deck which goes along it, but you can do that by covering the deck with planks made of light wood putting them butt-to-butt.

The structure of many ships with a weather deck allows you to make removable the whole middle internal part of the body together with the deck, bowsprit, and transom. It's very convenient as the after-part with windows and decorations remains uncut. The rigging of the bowsprit is going to be easier too. And we got all the luck because most details are located axially (such as hatches, bitts, tambours, capstans and many more). Thanks to this feature, many details are situated on the removable middle part of the model.

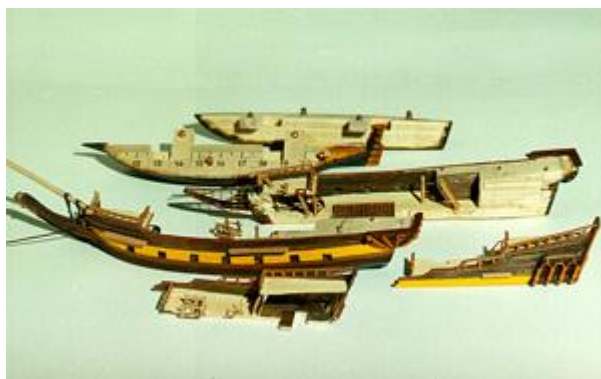
If it is impossible to make the middle part removable due to structural features, you should cut the whole upper part lengthwise. This cut will go along those elements located axially. It is still not bad, even vice versa. Don't cut those details together with the body; leave them whole and, gluing only one side, stick them to only one part of the body. As a result, all the additional details like hatches, capstans and tambours will be attached to only one side of the upper body part. You can easily take them off or install again. When assembled, those details will hide the cutting line on a ready model.

On the pictures below you can see the steps of assembling a body.

SHIPS IN BOTTLES



SHIPS IN BOTTLES



SHIPS IN BOTTLES



When the body of the model is ready, its appearance won't differ from a regular stand model. The only peculiarity is that the body of our model can be easily taken apart. Now let's proceed to the spar, rigging, and sails. Before doing this, you need to look carefully at the spar drawing and make a plan how to put the rigging through.

Spar and rigging.

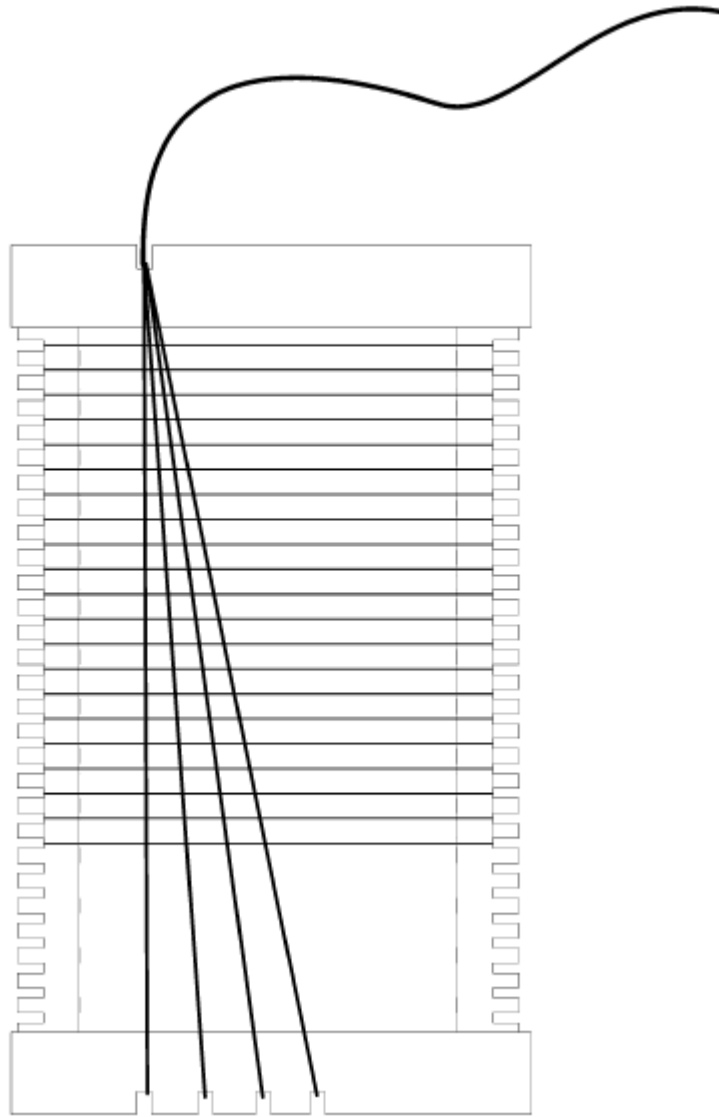
The next important step is to make rigging. It doesn't differ from that of a regular stand model except for a few details. Masts with crow's nests and crosstrees are made according to your drawing; shrouds are attached to shroud plate fixed on shroud plate beforehand. Try to imitate deadeyes and blocks. The rest of the rigging is assembled in a similar way. A lot of methods used by masters who work with stand models can be used here too. I will give you a few pieces of advice on how to make miniature details of a ship.

Make sure the masts as well as all the rest of the details are made according to your drawing; they should be beautiful and refined. You won't have to drill any holes in the masts, which allows you to make them thin without being afraid that they will break. You can make really good masts using beech wood. Ready masts are installed in special holes on the body; don't glue them so far. To avoid drilling holes in the masts, you can use small loops made out of threads for putting the tacking through. Tie them to the necessary place on the mast, bowsprit or any other detail of the model. In

SHIPS IN BOTTLES

that way, the treads of the rigging put through the loops will be able to slide easily. The threads will have to be bowsed inside the bottle.

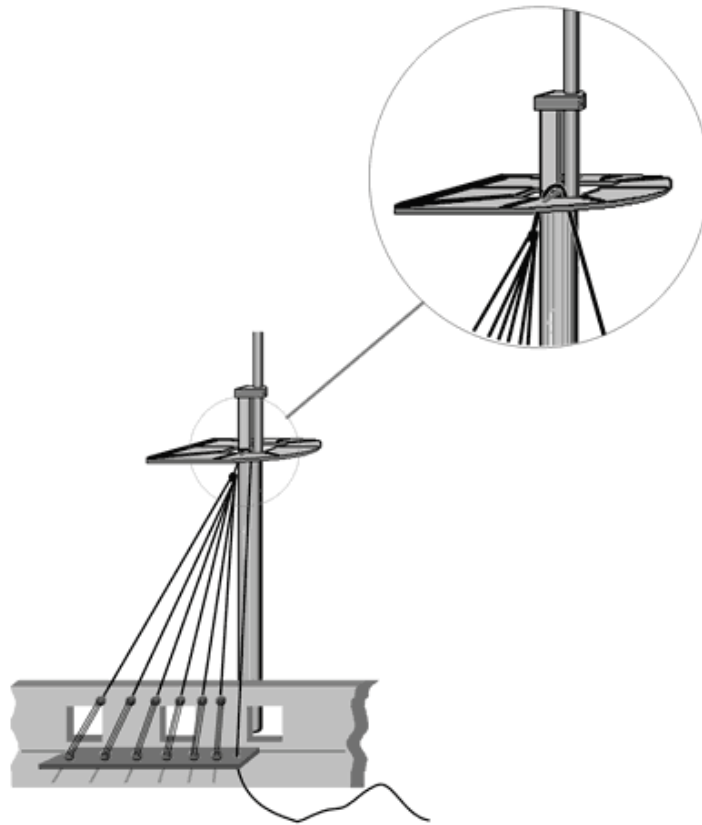
Shrouds are made with a special instrument which is very popular among model makers (pic. 21).



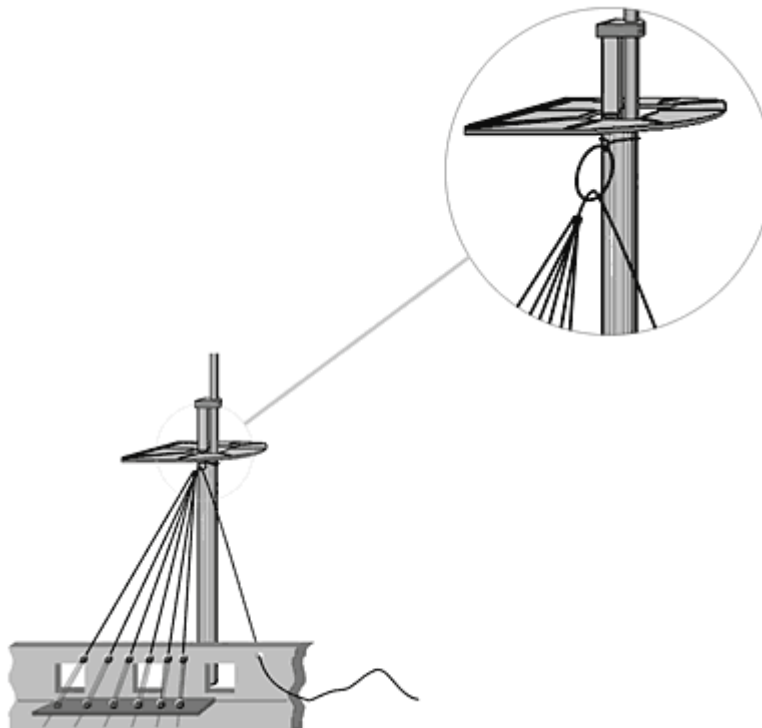
pic. 21 – A device for making miniature shrouds

This device allows you to glue ratlines to the shrouds. The structure of the shrouds has a special feature: you need to tie a long thread to the spot where shrouds meet. This additional thread will be put through a hole in the crow's nest. To do that, attach two loops on both sides or put a piece of wire on the crow's nest (pic. 22-23). The additional thread will be pulled down and then out through a hole in chainwales or the body (pic. 24).

SHIPS IN BOTTLES



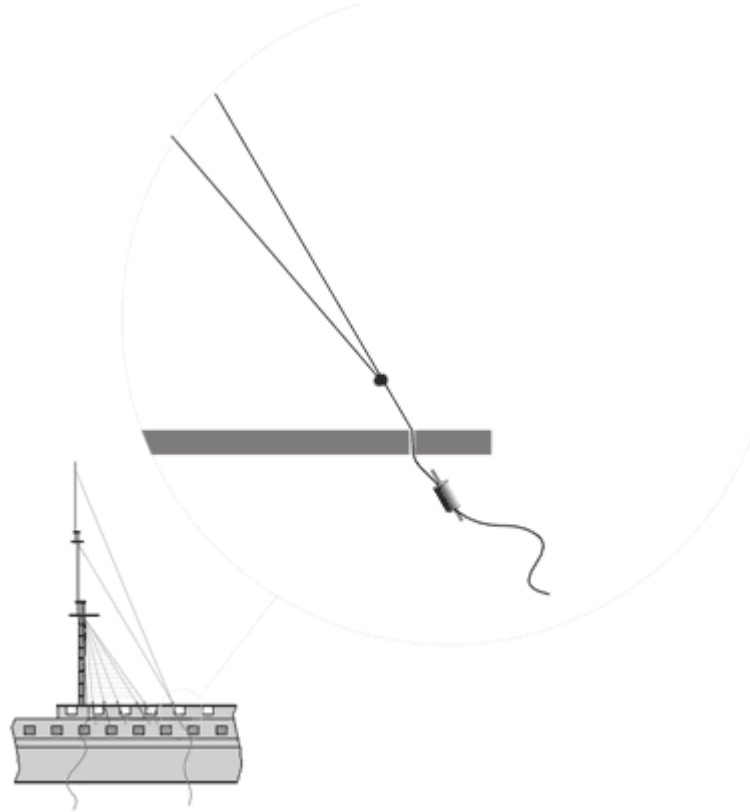
pic. 22 – To pull through the additional thread which holds the shrouds, glue a piece of wire to the crow's nest.



pic. 23 – To pull through the additional thread which holds the shrouds, tie loops at both sides of the mast.

SHIPS IN BOTTLES

To make the assembly easier, fix the installed masts in the position which they will be in on the ready model. You can use wire with insulation. Take off the insulation and cut it into pieces of 5-6 mm. Put such a piece on a necessary rope, squeeze it and insert a piece of wire of 8-10 mm. Using this method, you can fix any rope, and if you want to release it, take off the wire (pic. 24).

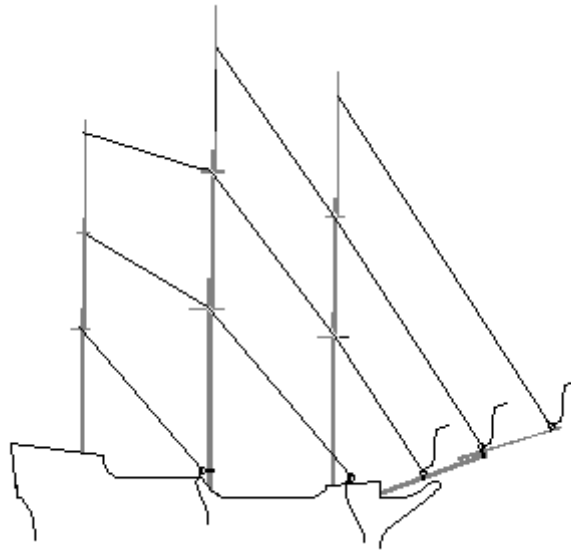


pic. 24 – To fix tackling , temporarily use a piece of wire and insulation

After you temporarily fix the additional thread, shrouds strain and fix them to shroud plates. Try to make the stretching as even as possible; after that you can make tiny dead eyes (in the form of little drops) on the shrouds using PVA glue adhesive colored with dark brown paint.

When making miniature backstays , remember that lots of standing rigging can spoil the appearance of a model. Moreover, it's impossible to find thread matching the dimensions of the model and you can only imitate topgallant stays. It is good idea to combine backstays threads together below so that through an opening there passed only one thread (pic. 24). After that temporarily fix the backstays with a piece of wire as described above.

Now you only need to attach stays according to your drawing. There is a little secret here: to make the installation easier you can join some of the stays of the mizzen-mast, mainmast and foremast. For example, instead of a main topgallant stay to fix on fore topmast, it pass through an opening in a cross-trees, and this tackle, having turned already in f ore topmast stays , it is passed in a small eyelet on a bowsprit. You can repeat that with the rest of the tackling (pic. 25)



pic. 25 – You can join some of the stays of the mizzen-mast, mainmast and foremast.

SAILS.

Sails are an important part of making a model; filled with wind, they make it light and swift. That is why you should take it seriously.

As you already understand, the masts and sails are pushed through the bottle neck separately; sails are not creased which allows you to make them “filled with wind”. There are a number of methods to make them and every master has his own favorite one, but I am going to tell you about only one.

First of all, you will need appropriate fabric; the best will probably be white lawn. Bear in mind that only some clippers and modern ships had white sails; the sails of older vessels were grayish or yellowish. That is why you need to dye them first: to get light gray color put the sails into hot water with aniline dye. But the best hue you can get from a bag of black tea: brew some tea and then simmer it for 20-30 minutes. Filter the blend and soak the sails in it until they get a necessary shade. Wring the fabric out and dry. This color will be lasting and look natural.

The next step is to outline sails on that well-pressed fabric; you can make it with a pencil and prepared cut-out patterns. To avoid fraying out of the fabric, apply some diluted PVA adhesive to the edges. When the sails are dry, cut them out and glue or tie to the yards. But sails also have some tabs on them – robands, sail battens, etc. So try to imitate them and don't forget about reef beackets.

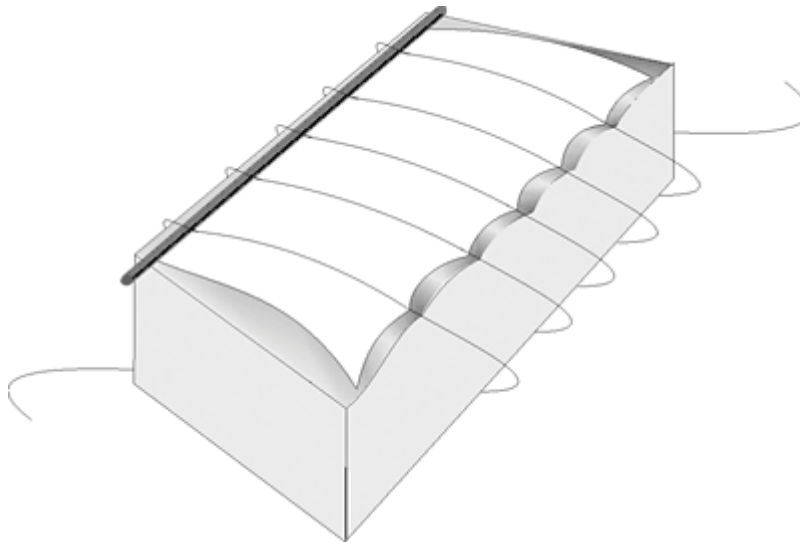
To make those tabs, you will need a piece of your already made sails soaked in PVA-glue adhesive and dried. Cut out a thin stripe and glue to a sail from the outside. It is going to be robands, sail

SHIPS IN BOTTLES

battens is glued from the inside of the topsail; it prevents the sail from fraying through the crow's nest.

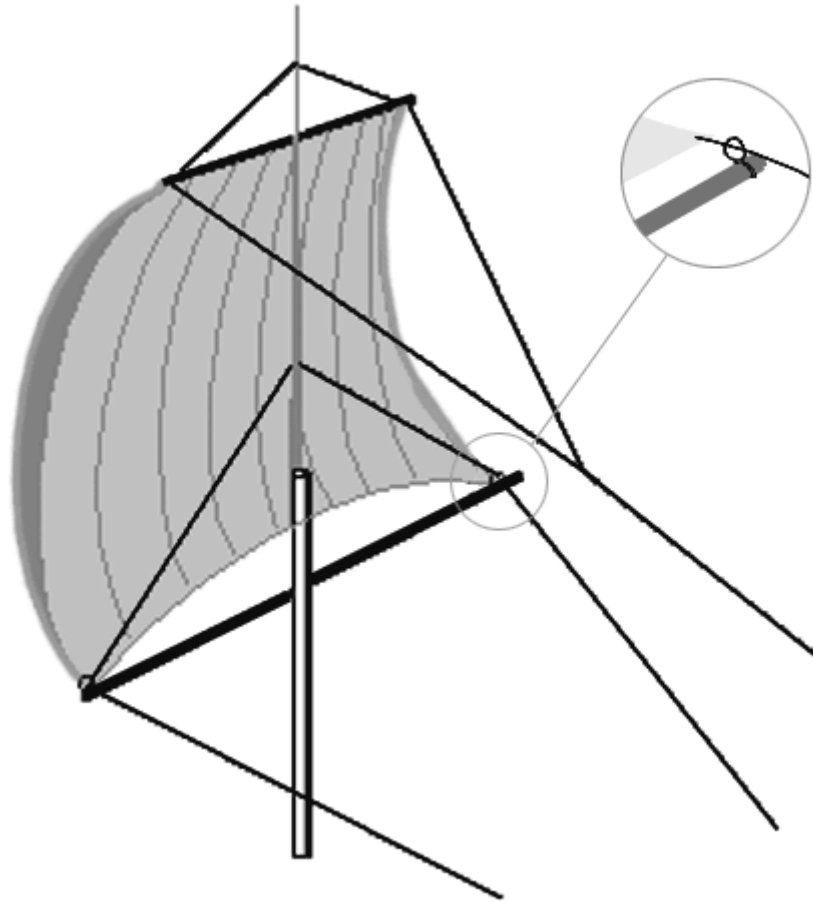
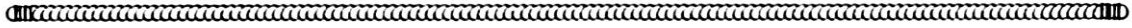
After that you can get down to making reef beackets. Put them through small holes made with a needle and fix with drops of glue. Of course, you'll need very thin cotton threads (or you can pull some out of the fabric you are using for sails), and it will be better if you dye the fabric darker color. Moreover, all the threads used for your model should be soaked in glue to eliminate the nap which is not allowed in such tiny models. Trim the ready reef beackets with scissors. All in all, making sails isn't easy; it takes time and patience.

Your sail is almost ready. To give it a filled-with-wind shape, you need to make a wooden, foam or any other form resembling it. You can make a few of them of different sizes if you are going to continue modeling. Put a piece of plastic film between the sail and the form so as not to glue them together. Press the sail with the attached yard to the form and fix with fishing line. The fishing line should go exactly along those lines where "seams" are; it will make the sail look more prominent (pic. 26). Soak the sail in PVA adhesive and dry to make it keep its shape.



pic. 26 - Press the sail with the attached yard to the form and fix with fishing line.

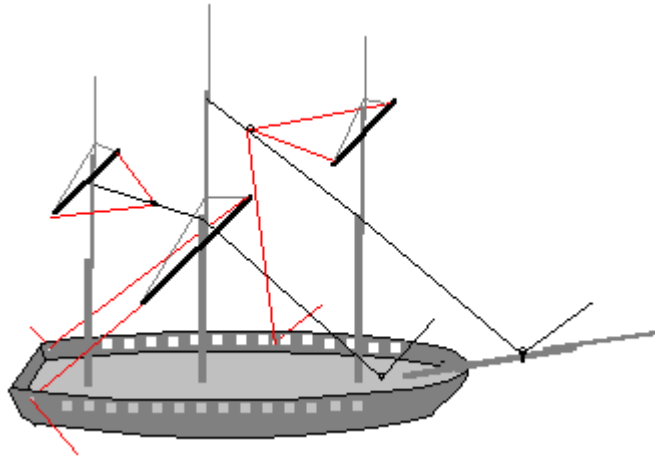
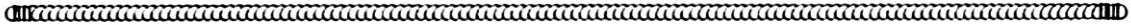
When attaching the sails to the masts and yards, don't forget that the whole construction should easily go through a bottle neck; try to make it more movable and avoid stiff fastening of the spar. For yards lashing and lifting on sailing ships, luffing cables, halyards, gunter irons and other devices are used. For example, it is convenient to attach the yards of mainmast and foremast with the help of luffing cable whereas the yards of the mizzen-mast – with gunter irons (that is, just to tie them to the mast). Sheet corners of the sails should not be stiff either, otherwise when you push them through a bottle neck they'll rumple. To avoid that, do not glue them to the yard; just do it inside the bottle instead. Or you can do it in a different way combining the functions of brace and sheet in one rigging. Tie a small loop to the yard-arm of the yard and put through it the rigging attached to a corner of the sail. Later this rigging will function as a brace and after covering will allow the sail to take up the right position (pic. 27).



pic. 27 - You can combining the functions of brace and sheet in one rigging.

When designing the spar, try to minimize the number of operations inside the bottle. First of all, it concerns a scheme of putting the braces through. The easiest way is to put the braces of the lower yards through the holes in the bulwark. The braces are often put through a block fastened to any of the stays. In this case it's useful to join the braces of the right and the left sides so that after going through the block on the stay (it can be a small loop) the rigging will be put through another hole in the bulwark by itself. The braces of the mizzen-mast look a bit different; they are usually pulled to the bow of a ship, not to the stern. That is why you can fasten them to a certain stay of the mizzen-mast (pic. 28)

SHIPS IN BOTTLES



pic. 28 – A scheme of putting through the braces in the bottle

A ship in full sail looks gorgeous, but the lower sails hide the deck preventing you from seeing all the small details on it. To avoid that, you can tie them to the yards; it will also save you from making sheets and tacks of the lower sails. As a result, the number of operations inside the bottle will be less.

However, sailing vessels in 15-16 centuries did not have lots of sails, so you would better unfold them. Of course, you will have to make sheets and tacks; it is quite easy to put them through; and you just need to put the tacking through the holes in the bulwark.

The same should be done with the rigging of the staysail and jib. Their sheets should be joined together and put through a hole in the bulwark. The structure of the mizzen-mast is not complicated to make; and there is no need to make systems that fasten gaff and boom to the mast. You can just glue them to the sail leaving 1-2 mm at the edge. The sail is hard enough to hold the gaff and boom in the necessary position. The sail glued to the mast together with the spar will be supple enough to go through a bottle-neck.

Assembly.

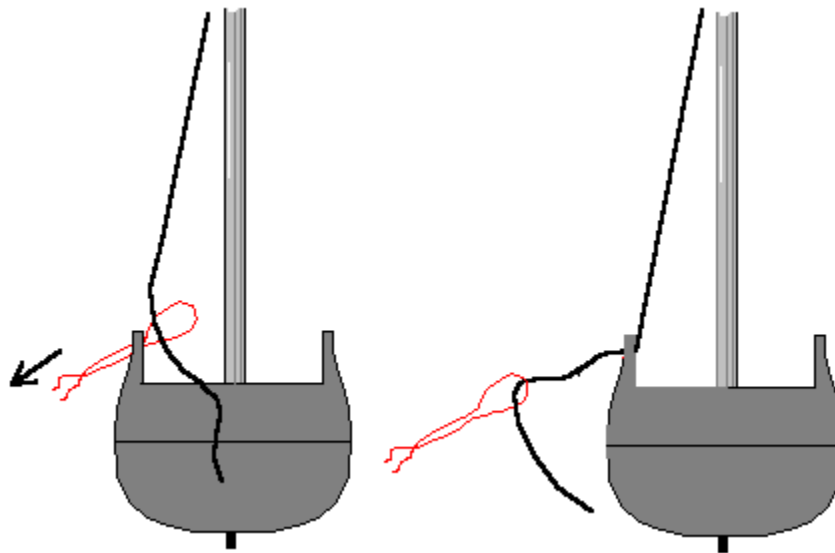
Let's have a look at what we have now after such long and laborious work. We have a model of a ship with long threads sticking out all over it. The most interesting thing starts right now. Take scissors and cut off all the threads leaving just 2-3 cm. The rest of the job will be done inside the bottle with short threads; unlike in the above described methods now no threads will hang down from the bottle neck. You won't be tangled!

Until now I still haven't shown you how to assemble a model inside a bottle. It wouldn't be sensible to hope to put all those threads into the tiny holes on the model. The secret is extremely simple: you need to make that tiny hole big. How? Put a loop made of thin thread through the hole. Now it's easy to put the end of the rope into the loop and, pulling by the other side, drag it together with the

SHIPS IN BOTTLES

loop outside (pic. 29). The loop will go through the hole easily drawing the rope. In this way you can put any thread through a hole even in a very difficult-to-reach place.

Before putting a ship into a bottle, you need to put loops into all the holes. The loops can be placed not only onto the body but also on masts and sometimes on sails. You'd better use colorful threads to make them more noticeable. Complicated model sometimes have 50-60 threads which requires a lot of efforts.

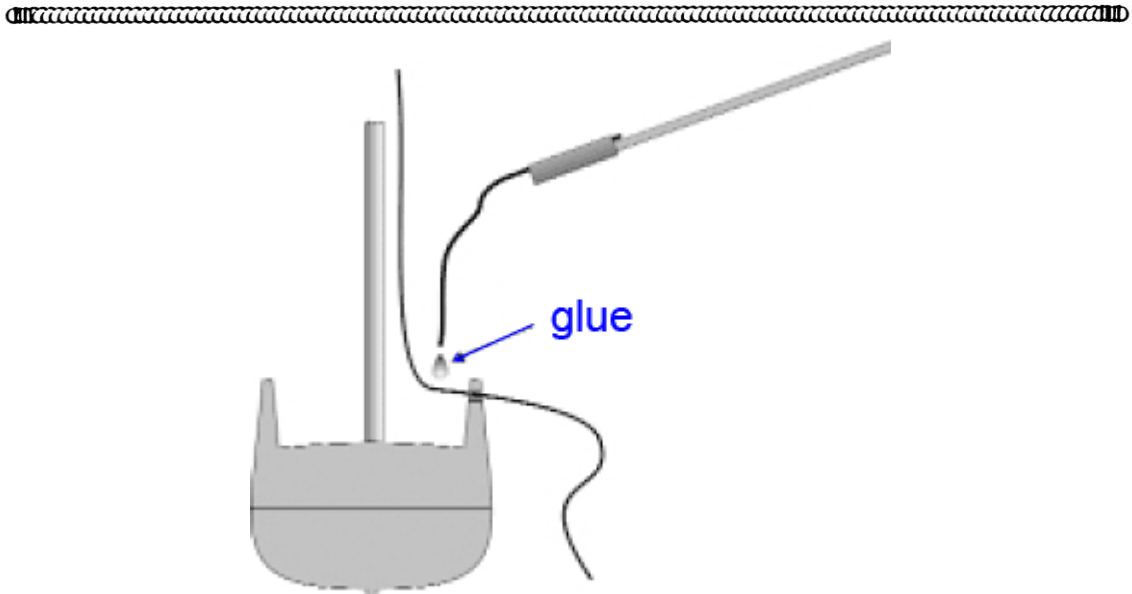


pic. 29 – the secret of assembly: you can make a small hole big in this way

Sometimes there happen unexpected situations such as accidental pulling out a loop without placing a rope in it. Don't let them bother you; they are not hopeless. Instead of that loop put a wire one through a hole and use it to let the rope go through the hole. If that doesn't work, place that "homeless" rope somewhere else.

The fifth method of assembling is in those loops. There is nothing else left for you to do but push the pieces of the body inside the bottle, glue them together and install the masts and sails putting the ropes of the rigging through specially made openings with the help of those miraculous loops. Be careful when assembling a ship inside a bottle: keep the ropes on the body off the gluing spots and try not to stain them with glue.

Start installing the masts from the bottom (with the mizzen-mast if the ship bow looks at the bottleneck). After installing the mast first pull the shroud threads of the right and left sides through the loops on the mast, then after drawing them out put them through the holes on the body or chainwale. Make sure the mast is in the right position by slightly pulling them. Only after that you can glue the threads: loosen a rope, drop some PVA adhesive on a thread so that when you pull it on, the glue drop is inside the hole. When the glue is dry, the end of the thread should be cut off (pic. 30)



pic. 30 - thread gluing

Now you know almost all the secrets. I only need to tell you about the instrument which you will need for work. It is quite unusual and hardly reminds “long tweezers”.

Instruments.

Different methods require different tools. Though you will still be able to use some of the described above. My experience shows that a universal instrument doesn't justify hopes, and it is more convenient to make a separate tool for every step (I am talking about work inside a bottle). The steps to be taken/made are the following:

1. applying glue;
2. stand assembly and gluing;
3. a ssembly of the body;
4. installing of the masts;
5. pulling the threads through the holes;
6. removing unnecessary threads.

Let's start.

A Tool for Applying Glue.

You are already familiar with one of them – a long steel stick with a spatula on the one end and a piece of wire on the other. You can't do without it if you need to apply a tiny amount of glue. And you could keep going without it if there was no need to use a large amount of glue at once, for example,

SHIPS IN BOTTLES

to stick a stand to glass or gluing together the parts of a model. In this case you can use a tool shown on pic. 31.

To make it you will need a medicine dropper, spray bulb, some pieces of copper or brass tube of different diameter. The structure is clearly seen from the picture: heat the thin end of the dropper on a gas burner and bend it until it reaches the angle of 90 degrees. The transparent tip helps control the amount of glue; moreover, if you make a few tips of different shape, you will be able to pour glue in any hard-to-reach place. The ready tip is put on a long tube on the other end of which there is a spray bulb; it helps fill the tip with glue and squeeze it out. Cut the thinner pipe and insert a thicker one with a hole in it, it will help you to control the amount of glue coming out of the tip.



pic. 31 – a tool for applying glue

A Tool for Holding and Gluing a Stand.

To stick a stand to the bottom of a bottle, you need to apply some glue to the glass and put the stand on it; in this case a special tool is used. Attach a pair of pliers to a long thin copper pipe, put on a bigger tube on one end; by moving it you will be able to grip and hold an item (pic. 32).

Of course, you can use the instruments described in other sections as well, but it is much more comfortable to work with this one.

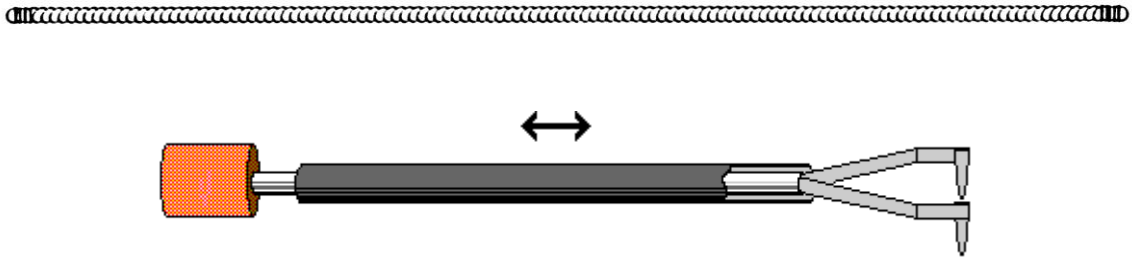


pic. 32 - A tool for holding and gluing a stand

Assembly of the body.

During the process the parts of a body are joined together and put on a stand. The tool used for that is similar to the previous one; the only difference is in the shape of its “jaws” – they are bent so that you can grip any tiny detail (pic. 33)

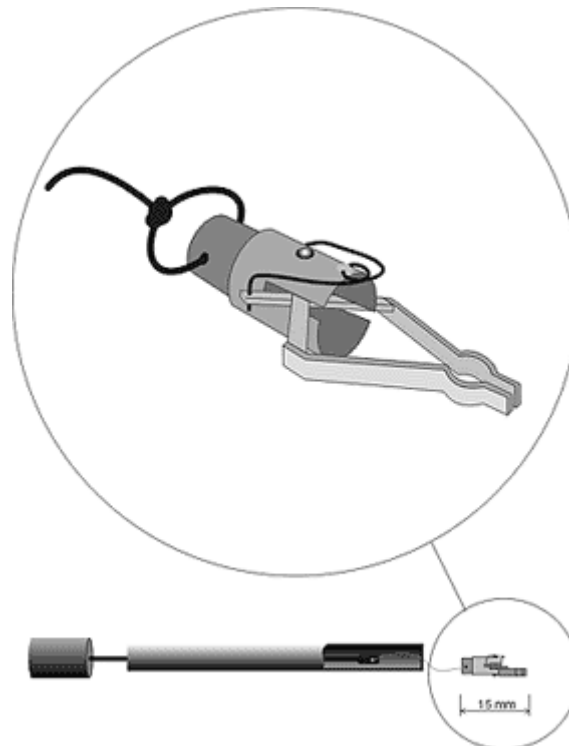
SHIPS IN BOTTLES



pic. 33 – a tool for assembly of a body

Masts installing.

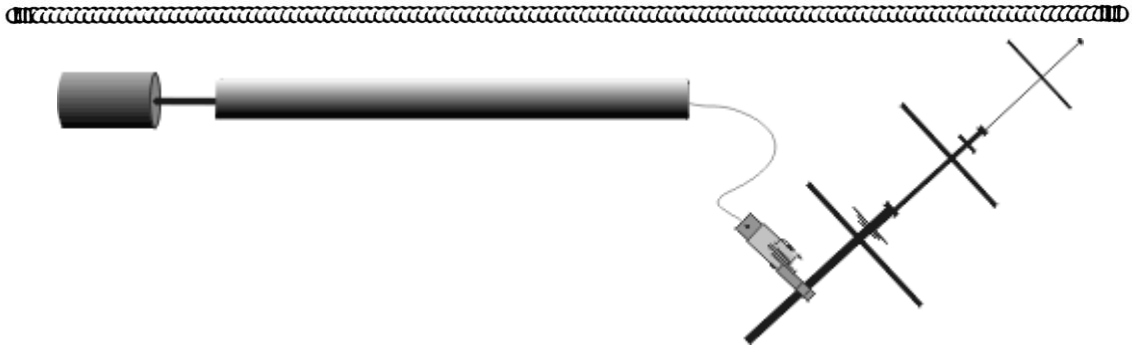
I have already described a device made of a long tube and a piece of fishing line. You can use it for masts as well, but I'd recommend a more complicated instrument. It has a little clip attached to a piece of flexible wire which goes through a long thin tube. Thanks to a spring, when the wire is loosen up, the clip holds a mast tightly, and when you pull the wire the clip opens up (pic. 34)



pic. 34 – a tool for installing masts

Put a mast into the clip and loosen up the wire pushing the whole thing inside the bottle; now pull the wire a bit to make the clip go inside the tube, it enables you to put the mast in a proper place. In the end just pull the wire stronger and release the mast (pic. 35)

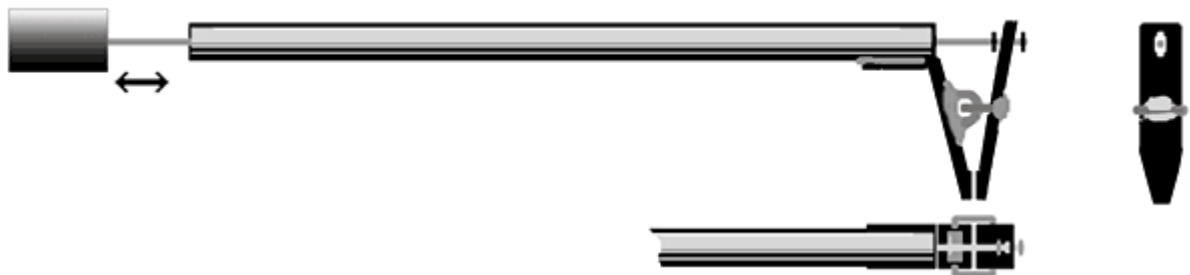
SHIPS IN BOTTLES



pic. 35 – put a mast into the clip, loosen up the wire and push the whole thing inside a bottle

Putting threads through.

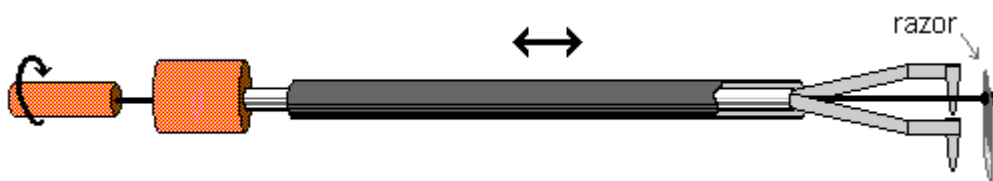
You can use the same instrument for work with rigging inside a bottle though there is a better one which supplements the former. It is simple but handy; usually it is the main tool of a model maker when he works inside a bottle (pic. 36) Simply attach clips joined with a joint to a long pipe. You can operate it with a long steel rod. This device helps you tightly hold a rope.



pic. 36 – a tool for putting threads through

Removing unnecessary threads.

The main tool you use for it is the described above long rod with a piece of flexible wire and razor on its end; usually it is very handy, but sometimes when you need to cut off ropes on a mast or a yard it is useless. You have to use two devices at a time which is not very convenient. That is why you need a tool that would combine gripping and cutting functions. It is similar to the already described tool for body assembly: hold a thread with clips and then spin around the pipe with razor cutting the thread (pic. 37)



pic. 37 – a tool for removing threads

SHIPS IN BOTTLES

You must have noticed that most of the instruments used for work inside a bottle are made of long pipes and have the same mode of functioning, and using it you can create some other useful tools. Besides, the tubes of such tools can have any length which allows you to work with bottles of any size and volume.

In conclusion to this chapter, I can say that now you know some secrets of making those unusual models of ships in a bottle, body and rigging as well as some tools for it. But don't forget that the real secret is in scrupulous work, careful making of tiny details and a constant pursuit of new ideas.

To make your work easier, the next chapter is dedicated to description of little secrets which will allow you to make some details of a ship with accuracy. It will be interesting not only for those making ship models in bottles, but also for people creating miniature table models.

Handy hints and tips for boat model makers.

How to make a good model.

After the ecstasy of your relatives from your first ship in a bottle subsides, try to evaluate your model: is it so good indeed? How to assess it? Of course, I don't mean money value since it is priceless, but a historical importance of it, even the importance for world culture (don't be surprised: your masterpiece can live for hundreds of years!).

While it is impossible to value a ship in a bottle as a piece of art, we can judge about its importance as a ship model. Imagine that you break that bottle and then look at your model; if it still looks perfect, then accept my greetings – you did a good job.

Although do n't try to make anything as long as it is in a bottle because you will only waste your time and energy. A bottle should just add even more charm to your model.

Making details of a miniature ship model.

Rope threads.

To find good threads for ship models is not that easy as it may seem since even the thinnest ones often turn out to be too thick. You can use hairs, synthetic or silk threads, but they are not very easy to work with. That's why I'd recommend pulling some threads out from a piece of cotton fabric.

SHIPS IN BOTTLES

Before using them, soak them in liquid PVA adhesive and wipe them immediately; after they dry out, they will look sleek and your model will not resemble the Flying Dutch which had roamed in seas and oceans for dozens of years.

Wheel.

Ships got their steering wheels in the 18th century; before that helmstock was turned with a vertical lever stock. After steering gears appeared, traction from steering engine was transmitted to the wheel with the help of steering ropes.

Steering gears of some ships were covered, and of course, making such a wheel is much easier than an opened one where you have to show all the details.

The main part of the steering engine is a wheel. To make it, you will need a few pieces of copper wire and a copper ring. Wind the wire round a bar of a desirable diameter and then cut along the spring that you get. Now you have a lot of identical rings.

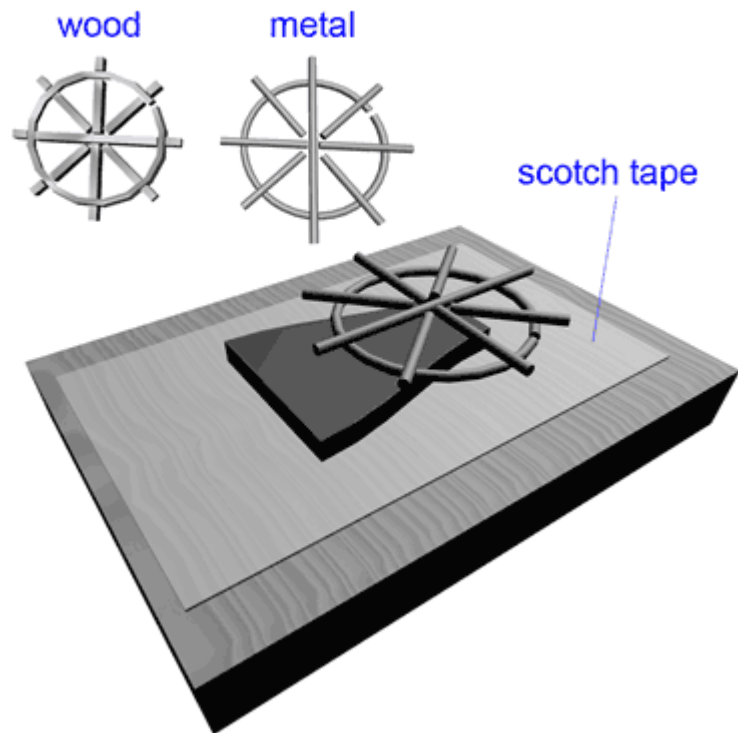
Spokes are made of copper wire as well. To make it look like wood you need to heat it using a certain temperature, since during the process copper changes its color from golden to black. A layer of nitro lacquer will fix the color. The assembly of the wheel is carried out exactly on that place of the steering gear where it is on your working drawing.

Working with such tiny parts, a boat model maker faces some problems; for example, you have to constantly hold a detail which wants to slip off all the time, and you'd better not use clutches, because you can easily damage those little things. There is a way to handle it: attach a piece of sticky tape to a wooden bar and drop a bit of glue, then put a part you are working with on it. Now it is fixed. To remove it just use a sharp knife.

Now, using a magnifying glass, you can start assembling the wheel. First attach no less than 8 spokes and then the ring (pic. 38). You still can use PVA-glue adhesive, just make it more liquid. After assembling the wheel, join together the rest of the parts of the steering gear and put it into a designated place. Do not forget to install a steering rope.

Using this method, you can even make a wheel on a scale of 1:700, however on bigger models beginning from 1:500 you can try to make it of ... wood! First of all, find good wood for it, for instance, apple or pear wood. Take a thin plate (0,2-0,3 mm), moisten it and cut into thin straws. Make sure your knife is very sharp and the cut goes along the grains of the wood.

SHIPS IN BOTTLES



pic. 38 - assembly of a wheel



Choose the thinnest and the straightest one, soak it in hot water for 10-15 minutes and wrap around a metal rod like you did it with copper wire. The straw will not break if you cut it exactly along the grain. Wind a piece of paper round the straw to fix it before it dries out. After drying take off the paper and cut along the straw spring. Join the point of rupture with some glue. The strokes are cut from the same straws, but make them shorter as you need to be able to put them inside the rim. Prepare handles by cutting off little squares out of the straw.

Neatly made wheel will only beautifies your model since an image of a ship closely associated with a mustached boatswain standing at the steering wheel.

Sky lights, windows and portholes.

The windows of a ship can be either square or round. The former are rectangular glasses with brass or bronze frame; the latter have metal frame. Some hatches used to have necking of portholes or glass lids to let the air in when they are raised. They are called skylights.

Miniature portholes are made of brass rings by coiling thin wire round a round frame and cutting it along. Make in the same way framing for windows, except for it should be square. Wrap the wire tightly round the frame. To make the angles sharper, use broach file. The ready windows and portholes are glued to the model; color them black as it is dark inside the cabins (unless the light is on) (pic. 39)

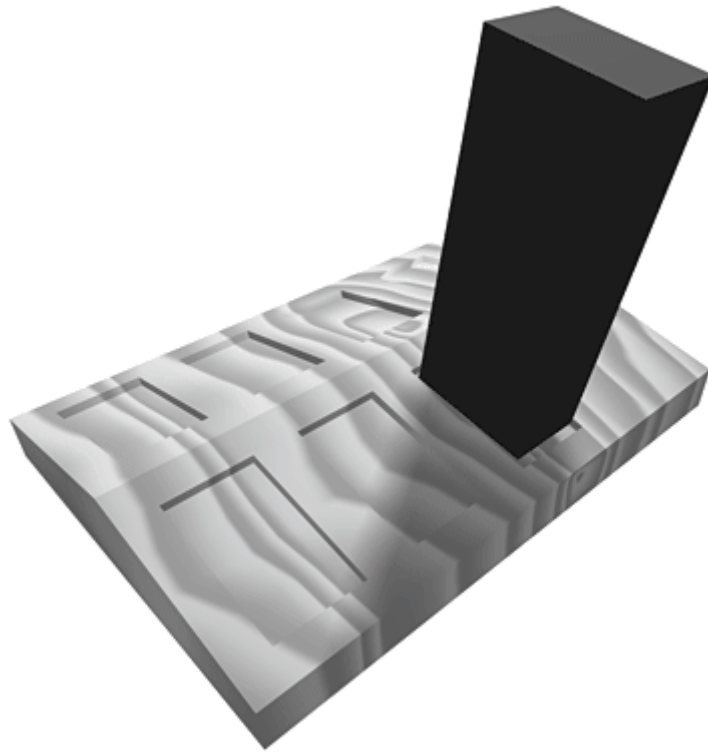


pic. 39 – skylights

You can make the simplest skylights in the same way by sticking rings to a wooden base. A more complicated task is to make them with wooden frames. For that you can use apple or pear wood; and your work piece should have a profile of a future porthole.

Now you will need a rectangular or square stamp, its size should coincide with that of the windows. It can be made of metal rod. You can also make a few different sizes and add a handle to each of them.

Mark the location of the windows on the work piece and make cuts across the grain to avoid wood mashing. Then press it with a stamp of a suitable size (pic. 40). If the work is done well, you will see very thin windows with frames between them.



pic. 40 – using a stamp for making miniature wooden skylights

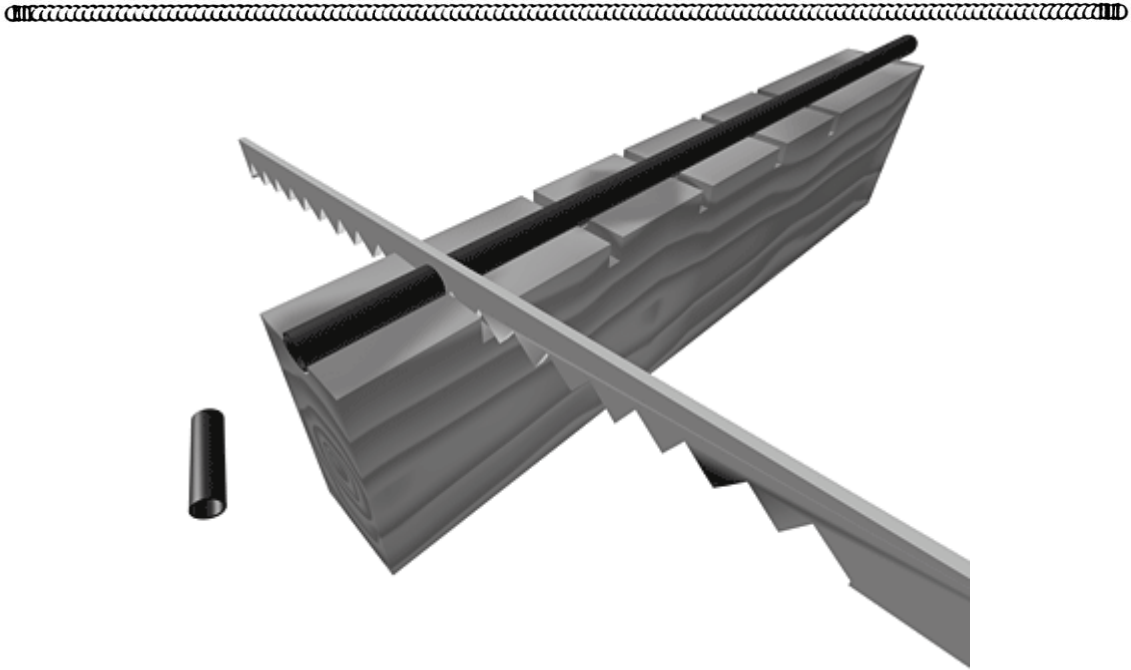
This method can be used for making gun ports, windows, doors, and other details.

Cannons.

The main parts of cannon are gun barrels and gun carriage where it stands. You will need to reproduce them.

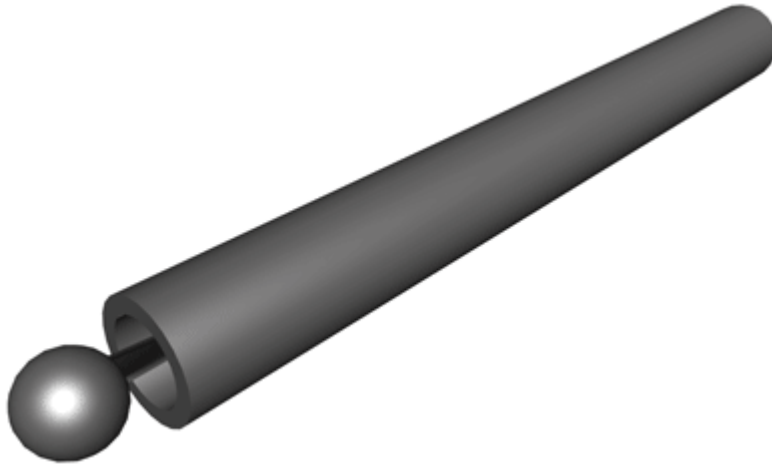
For gun barrels take thin metal pipes no thicker than 1 mm. Heat them to get a black color and make them soft. Then cut the pipe into pieces (I'd recommend a bar with slots which you can see on pic. 41) Put a pipe into a slot and fix it. After removing burrs, heat them up again, it will restore the color.

SHIPS IN BOTTLES



pic. 41 – to cut the pipes into pieces is easy using a wooden bar with slots

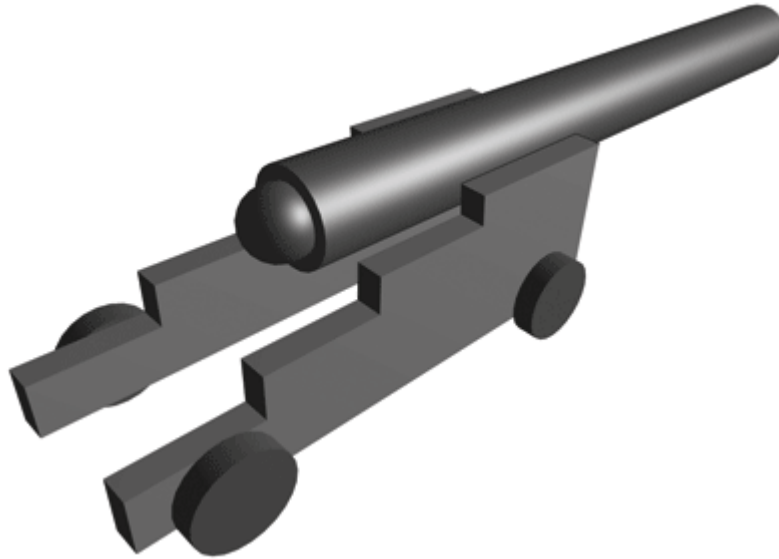
To make a breech, you will need little metal balls: heat copper wire holding it vertically; it will melt forming small balls on its end. When cutting them off, leave a tiny tail to attach it to a barrel. Preparing such balls is a very difficult task, so you'd better make a lot of them at once and then sort out by size. All you have to do now is to glue a ball to a barrel, and your cannon is ready (pic. 42)



pic. 42 – a gun barrel model

Of course, to reproduce a very accurate copy of cannon, you will need a turning machine, but using this method even a beginner can make nice gun barrels.

The sides of a gun carriage are cut out from wood; glue little wheels to them (which you can cut out of a round wooden stick). The sides are glued directly to the gun barrel (pic. 43). You don't have to make a gun carriage frame as it is not seen on such a small model. But if the size of the cannon allows you, you can make tiny blocks and tackles using thin threads.



pic. 43 – the gun on a mounting.

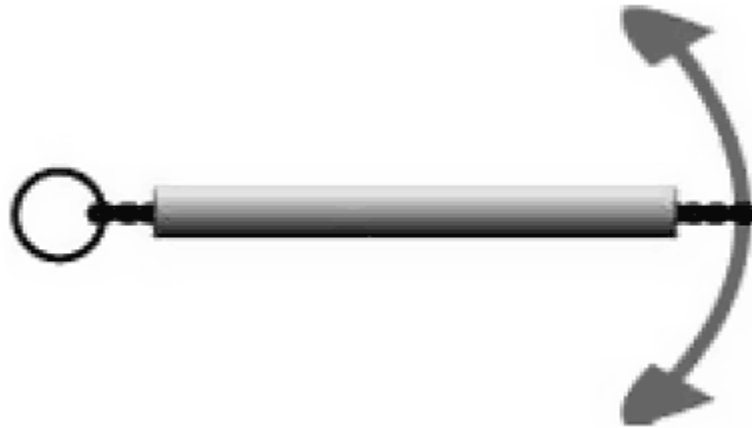
Anchor.

The modern look of the anchor dates back to the V century BC. In the ancient world they were made of wood, and only in the Middle Ages an iron anchor with wooden stocks appeared. The shank of an anchor was made of several rods welded together.

To make an anchor, you will need the same metal pipe that you used for cannons. Cut and process them as it was described above. The beaks of an anchor can be made of metal wire; squeeze the ends with flat-nose pliers and shape them with a broach file. You can attach the beaks to the shank by wrapping the wire round the beaks and joining together the loose ends. Drop some glue on them and insert them into the shank. A ring made of wire as well is attached to the other end. Besides, such a design imitates a ring serving very well. The ready anchor should be heated to get a dark color; you even don't have to paint it.

Now you need to make a stock. Glue together two wooden slats with a slot for the shank (pic. 44). If the size allows you, you can make balancing band of a stock of metal foil or threads.

Attach a chain or a rope, and the anchor is ready.



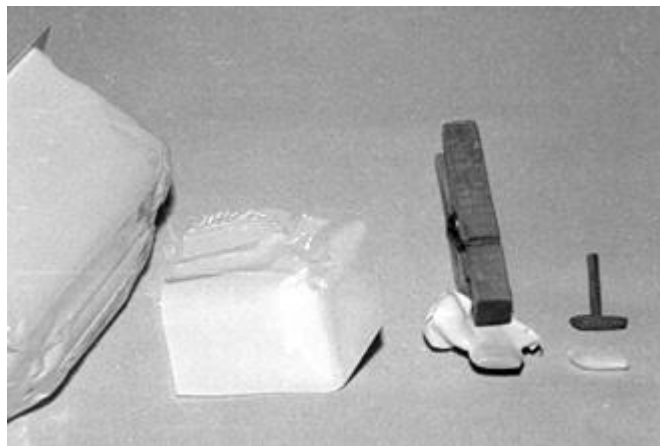
pic. 44 – a model of an anchor

Rowing boats.

Since the old times, boats have been used for carrying people and goods. There exist various designs and names, such as quarter boats, yawls, whaleboats, and other. In the past the rowing boats were placed between a mainmast and a foremast on the waist deck. Later, they were hung up on cranes on the stern.

However, to make a good-looking boat is not an easy task, and often you can see a neat model with crude boats. Actually, they can be made of different materials, but in my opinion, only moulding will allow you to create accurate and fine rowing boats. This method is simple even for a beginner. First of all, you need to make an ingot having a shape of a future boat. Cut it off a piece of wood and get it on a stick. You can make a few ingots at once; they will be useful for your future work.

The best material for that is polymer film which easily changes its shape when heated to 100 ° Celsius. Use plastic food boxes (pic. 45); the thickness should not exceed 0,1 mm, or else it will not be able to reproduce the shape.



pic. 45

SHIPS IN BOTTLES

Take a piece of the polymer film, cover with it a wooden ingot and fix it with a clip. Now pour boiling water over it to make the film get the shape of a boat. Then just contour the boat, paint it and attach the missing details. To make painting easier, cover the boat with acetone using a soft brush. After that the surface becomes rough which allows the paint to cover it evenly. Finally, glue thwarts and put a few oars, and your accurately made rowing boat is ready.

Moulding enables you to make small details, while making big ones requires more efforts. Using that method you can make some other details, such as tops of old ships, lampshades, parabolic-dish antennae of modern vessels, bells and many others. You will learn about some of them below.

If you do not want to use plastic, try aluminum foil. Simply squeeze it with your fingers though it has to be primed before it can be painted.

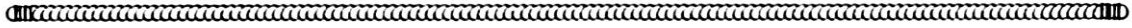
Stern Lamp.

Old ships had big, richly decorated stern lights with a lot of glasses inside; they were put on a metal stock on the stern. Flagships had three lamps; one was in the middle, and two on the sides. Ships of an admiral or a commander had one more on the top.

Of course, it is not easy to reproduce all the decor on those tiny models; however, if you make some efforts, you can get some good results (pic. 46).



SHIPS IN BOTTLES



pic. 46 – a stern lamp

To begin with, make a little ball on one end of a piece of copper wire using the method described above; it will be a base, and the wire will become a stock. It will also help you fix it on the model. The ribs are made of copper or brass wire. You can imitate décor by squeezing the wire with pliers which gives it a nice print or just twist two pieces of thin wire.

Glue the ribs to the ball from different sides (usually four ribs are enough). Now make a lampshade using the same method of moulding. The form is made of metal stick with a few panes on the butt end. The rest of the work is the same as for making boats. The ready lampshade is glued to the ribs from above and painted silver or bronze; you can decorate it with a ball or a little capstan made of thickened paint.

Tops of old ships.

Old square-rigged ships had tops in the shape of a basket. Such grounds helped operate the sails. Very often there were riflemen on the tops during a battle armed with bows, arbalests and later fire guns. With time, the shape of the top changed from a basket to an almost rectangular ground.

To make an accurate copy of a top, prepare a few thin wooden rings; they can be made of redwood veneer. Choose a piece with clearly seen grains, then sandpaper it to reach the thickness of 0,2 – 0,3 mm, after that wet it and cut into thin straws. Make sure the cut goes along the grain otherwise the straws will break when bent. Soak the straws in hot water for 10-15 minutes to make them more flexible.

For a basket you will need rings of different diameter. To get them, wet straws are wind round sticks of different sizes and fixed with paper. After they are completely dry, take the paper off and cut along the spring into rings. Glue the rings joint to joint. The bottom can be made of redwood as well, just remember to make a hole for a mast in the middle.

Now prepare a good deal of small squares using the rest of the straws; they will be the poles of the basket. Glue them around the bottom; put a ring on the first row and then glue another row; repeat a few times. The upper ring of the basket is usually bigger, so when making the last rows you can use long strips instead of squares.

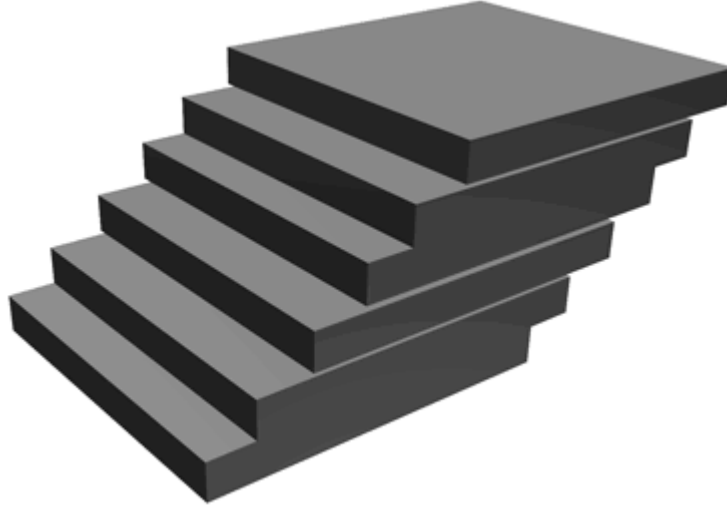
Ladders.

Ladders are used for people to get from upper lever to lower one and vice versa; there exist inner ladders joining upper deck with lower one, and outer ones leading to the board.

It is not easy to make those ladders on a scale of 1:1400 or 1:1700, however these are the details that decorate your model.

SHIPS IN BOTTLES

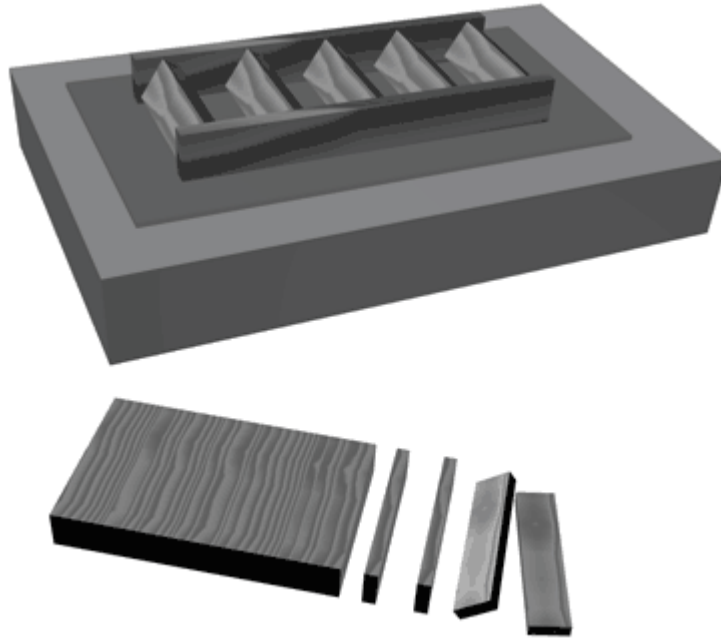
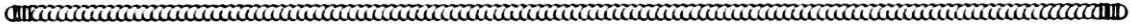
There are some ways to do that, though. A ladder leading to hold and suchlike are the simplest ones to make as you cannot see their sides. To make it, just glue together a few wooden squares shifting them as you put them one onto another (pic. 47)



pic. 47 – to make a simple ladder, you have to glue together a few wooden squares shifting them as you put them one onto another

The ladders that can be seen from every side are more complicated. They consist of two side boards and a few horizontal steps which can be made of hard wood like apple or pear. Besides, those ladders can have railing. Before joining all parts together, you will need that wooden bar with a piece of sticky tape.

Stick a rib of one of the side boards to the bar (pic. 48). While the glue is drying out, prepare a few even steps: cut off one step across the grain, it will be your pattern, then using it cut off the rest of the steps.



pic. 48 – assembly of a ladder

Now you are ready to assemble the ladder. Take a magnifying glass and tweezers and glue the step to the side which was attached to that wooden bar and make sure they have the same angle and distance between each other; after that, the second side is glued to them. After complete drying detach the ladder from the bar with a sharp knife. There might be some glue left on the reverse side, don't let it bother you: when you install the ladder, the glue will not be seen. The railing can be made of thin redwood sticks or other wood.

Woodlings on the masts.

Lower masts of big ships and bowsprits were made of a few banded squared bars called woodlings. Usually it consisted of 5 or 6 winds of a rope laid around the mast. Later iron hoops were used.

Of course, there is no point in making a mast out of a few squared bars, but it is recommended to equip the model with woodlings. Use the same wooden bar with a sticky tape; wrap a thin thread around it in 3-4 layers putting them very close to each other. Apply some PVA adhesive and, after it dries out, cut the stripe on the sides. You get a ribbon consisting of a few threads. Cut it into pieces of a necessary size and stick to the mast. To make it fast and accurate, wrap the ribbon round the mast and cut it axially (just like you made rings out of wood or wire). The length of such pieces will coincide with the perimeter of the mast. To make the joint of woodlings less visible, put it into a back side facing the stern. Such woodlings look extremely real.

Oars.

The thought that you will have to make 40-50 oars for an old galley can make you upset, but don't be. There is a way to make a large number of them of any size.

Take a piece of copper wire and cut into pieces of a necessary length. Then even them by rolling along a flat surface. Squeeze the ends with pliers to make blades, and an oar is ready. Paint it any appropriate color or heat it over a fire which will give it a dark-brown color looking like wood. To fix the color, cover the oars with a layer of nitro lacquer.

Anchor chain.

Anchor chains were firstly used only in the 18th century; before, anchors were held by shrouds. To make a simple anchor chain, join together two pieces of copper wire and squeeze them slightly with pliers. Heat it over a fire to make it dark. As you can see, the process is not complicated at all.

Life buoy.

Life buoys are easy to make and you will need them for models of modern ships. Take red or white wire insulation and cut it into a bunch of small rings, then paint the second half of a ring red or white depending on which color the ring is.

Blocks.

Sailing ships have had blocks since old times. The shape has remained the same since then. More than 200 models were used in fleet, but for a miniature vessel you will have to make only dead eyes and simplest blocks for putting the running rigging through.

At this step even an experienced model maker can face difficulties since the dead eyes of a model built on a scale of 1:450 are only 0,5-0,6 mm in diameter, and blocks are even smaller. That is why you won't be able to reproduce them with high accuracy, but only imitate them. Apply a drop of thick PVA adhesive to a necessary spot on an shroud which after drying will look like a dead eye or a block.

However, you can make the blocks look more real on bigger models. For that purpose use hard wood. When a model has a scale of 1:220, the diameter of a dead eye is about 1 mm. Cut them out of a thin wooden stick and drill holes placing them on a slot in a wooden brick. It is a very laborious process and, if you cannot drill the holes, you can glue turnbuckles to the work pieces (the turnbuckles are made in the same way as woodlings by joining together the threads)

SHIPS IN BOTTLES

Unlike dead eye, a wooden block requires only one opening. If you managed to drill three in the dead eye, then this will be a piece of cake for you. Ancient blocks can be cut out of a wooden stick as well, but its section can be either round or oblong.

Reefs.

Reefs are a horizontal row of strings – reef beackets - which are put through a sail that enables to reduce the sail area when needed. To fortify the sail in the area where reef beackets are located, attach a stripe of sailcloth (reef bands) parallel to foot. One of the methods to make reef beackets and reef bands was described above. Let me add one more interesting way.

Take a piece of lawn about 5x5 cm of the same color as the running rigging of your model. With the help of pincers remove every other grain of fabric (or even more depending on a scale of the model) so that the fabric looks like gauze. Drop some glue onto the ends of the cloth and attach the reef band above. When the glue dries out, cut off the lawn leaving threads of 3-4 mm on the sail. Turn the sail and repeat the procedure. As a result, you will get even rows of reef beackets. The piece of lawn can be used until it has no threads on it.

Body decorations.

Old vessels were richly decorated with carved gilded figures; usually they were on the bow and stern. It is quite impossible to reproduce them on a miniature model; all you can do is to designate them with clean brass wire. To make them more relief, squeeze them slightly with ribbed pliers (you did that when you worked on a stern lamp). Of course, you should remember about a figurehead; cut it out of wood and paint golden.

Bunks and bunk mesh.

Some big ships had special sections called bunk mesh where sailors put rolled bunks. For imitation of those you can simply cut white wire insulation into pieces, but those made of fabric look better. Take a piece of lawn and cut it into pieces 5-6 mm in width and 50-80 mm in length. Then put a stripe on a flat surface and apply some PVA adhesive, after that roll it up into a tube. You should get a thin tight stick; cut it into pieces, glue to each other like paling and attach to the model. Glue thin wooden slats, or thin wire, or threads depending on your design to imitate bunk mesh.

Ventilation pipes.

Natural ventilation goes through special pipes with wide funnels on the ends; the funnels are installed on the deck and are used for air intake or drawing out.

SHIPS IN BOTTLES

Large pipes for big ship have to be done of wood or metal while smaller ones can be made of copper wire. Squeeze one end with pliers and bend it until it reaches 90 °; then turn it upside down and squeeze again with the shorter end up. Grind this end off with a broach file almost up to the base. While grinding, there will appear a burr which imitates a socket of a pipe. Paint the ready pipe a desirable color.

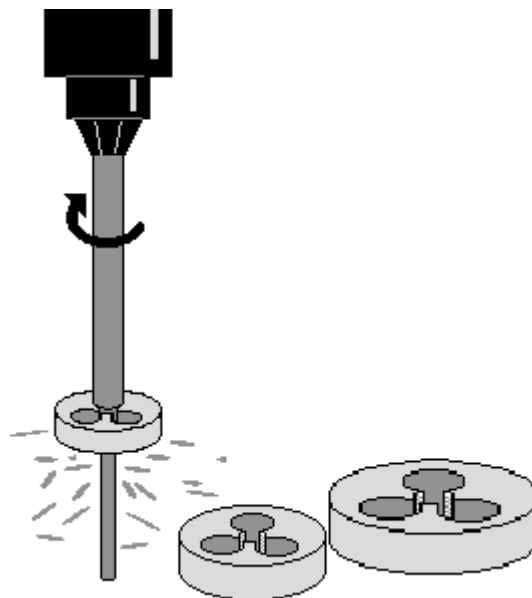
Ship's bell.

Old vessels had only one bell which firstly was on the stern and later on the foredeck. Warships had two.

You can make it using a turning machine a brass wire, but it's better to use the method of moulding (see chapter "Rowing boats"). Use a metal rod as a form with an end in the shape of a cone. Paint the ready bell bronze and attach a tiny tongue made of copper wire. The said method is convenient as it allows you to make several perfectly identical details.

Work pieces for masts.

Round wooden sticks of any diameter can be easily made with chasing tool used for threading. Squeeze a work piece in a drill chuck and put it through a chaser of a necessary size; then repeat the operation with a chaser of a smaller size until the mast reaches the size you need. Finish it with sand paper without taking it out of the chuck.



If you get a few chasers with the size 1,5 mm-5,0 mm and a pitch of 0,5 mm, it will allow you to make masts, yards and other round parts much faster.

Incredible Corks.

As any picture, a ship model needs framing to look worked up. An unusual cork and a stylish stand can do the trick. A lot of boat model makers don't pay much attention to them after working hard on making a fine model. However, the cork and the stand can turn a plain ship into a gorgeous one. What does "an unusual cork" mean? It's a cork sealed from the inside so that it can't be taken out without breaking the bottle. Such corks were made by skilful boat model makers in 17-19th centuries. Their masterpieces are kept in museum and still admire people. Some secrets have been found and some had to be invented again.

On old pictures you can often see bottles with corks sealed with a wooden stock from the inside; unfortunately, their makers can't tell us how they did it; let's try to do that ourselves.

One of the most antique models is in a museum of a German city of Lubek. It is a huge three-masted warship in a big glass oval bulb. This model is extraordinary because the bottle stands on its cork which is also a stand. That is how it could be made (pic. 49).

The structure has three main parts:

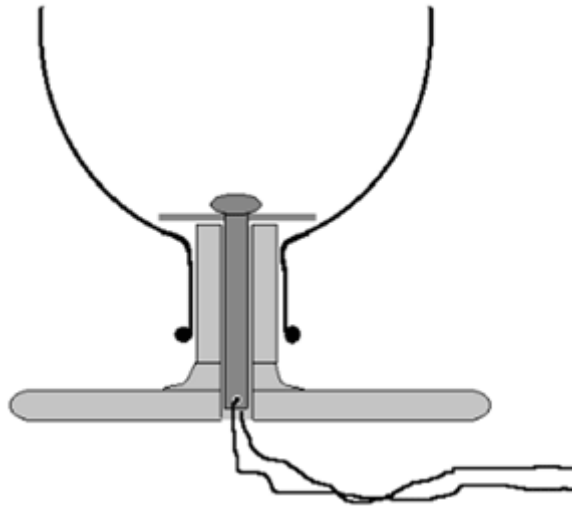
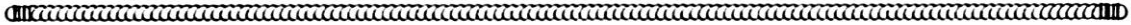
1. the cork itself with a hole in the middle which forms a unit with the stand;
2. a stock in the shape of a bent plate with a hole in the middle;
3. a peg which holds the whole structure.

The assembly goes in the following way:

Tie a thread or even a fishing line to a peg end and put it through the cork and the stock. After they are inside and the cork is in its place, pull the thread installing the parts onto designated spots. Apply some glue to the opening in the cork to fix the whole thing.

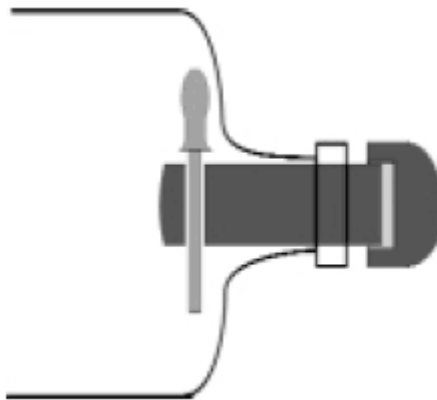
Such a structure can be used when making a simple cork which is not joined to the stand. In this case you don't have to make a through hole; just drill a hole of 0,5-1,0 mm in diameter to the depth of 2-3 cm on the side through which you will pull the thread out. The procedure is the same: pull both ends of the thread to install the parts on their place and pull just one end to take out the thread. Such a thread appears almost in all methods of assembling of corks-puzzles; it's used for pulling out threads and putting the details into their places.

SHIPS IN BOTTLES



pic. 49 – such a cork consists of three parts

You can also cork up a bottle from the inside. The head and the cork are made separately; then the cork is pushed inside and the stock is inserted as well; after that the bottle is corked up from the outside. Only after that you can attach the head. If the work is done neatly, the seam between the cork and the head will be almost invisible. Using this method, you can make a cork with a very complicated stock which can't be made in any other way (pic. 50)

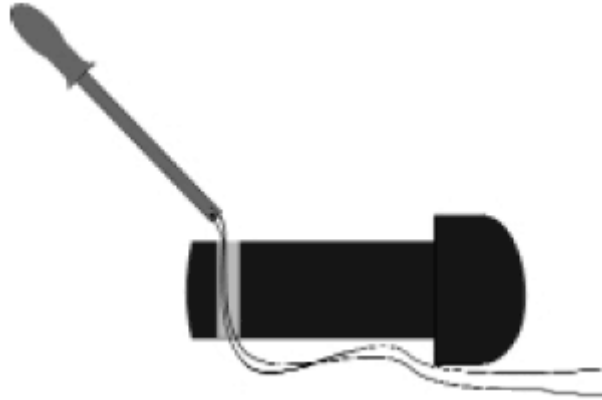


pic. 50 – a bottle can be corked up not only from the outside, but from the inside as well

There is another way to do that when a cork and a stock remain whole. It is the simplest and most common technique of making corks-puzzles. Put a thread attached to the stock through the opening in the cork. After installing the stock inside, the thread is pulled out (pic. 51). In this case the stock is a bit shorter as the sides of the bottle limit its length preventing it from installing into its place. However, you can double the length of the stock.

The secret of this cork is in the stock which consists of two parts. They are inserted into the cork from different sides and look like a unit when assembled.

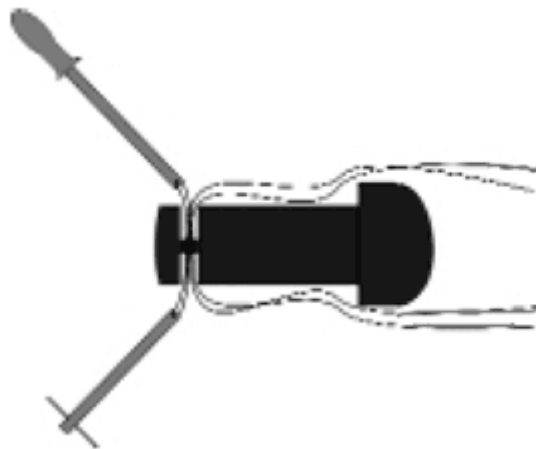
SHIPS IN BOTTLES



pic. 51 - Put a thread attached to the stock through the opening in the cork. After installing the stock inside the thread is pulled out

Make sure that the stock halves don't go through and are not in each other's way. For that, in the middle of a hole designated for the stock leave a little bridge with a hole for threads. The details of the stock are fixed with glue (pic. 52).

In the method described above the stock is attached rigidly to the cork, but if you make it movable, the effect can be intensified. The secret is in the structure of the stock – it is hollow inside, i.e. it looks like a wooden pipe.



pic. 52 – the parts of the stock inserted into the cork from different sides look like a unit when assembled

You can make it using a turning machine or manually by drilling a hole in a wooden work piece (pic. 53). The pipe is cut into halves, then at an angle.

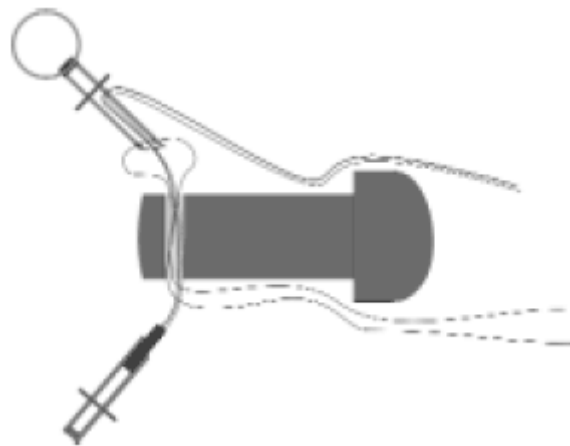


SHIPS IN BOTTLES

pic. 53 - The secret is in the structure of the stock – it is hollow inside, i.e. it looks like a wooden pipe

To make the parts of the stock look like whole wooden sticks, the ends are corked up with corks made of the same material. You can even decorate it with a bow, ring, or any other detail.

The halves of the stock will be joined with a wooden pin which is inserted into one of the pipes (pic. 54). Drill two holes: one on the end of the pin and the other on the opposite end of the stock. You will need them to pull through a thread to join the parts together. You will also need to put the parts inside a hole in the cork. Thanks to the thread, the detail with the pin will do it easily, while the second half will need a thread which can be attached to the sides.



pic. 54 – assembly of a cork-puzzle

Before putting a model in the bottle make sure all the parts are joined together and the process will go off well. Apply some glue on the inner surface of the stock and immediately insert it inside. The part without a pin goes first; then the bottle should be turned so that the stock does not fall, after that you need to remove the temporary thread. Next, insert the second half and when both parts are joined correctly the thread should be removed as well (just pull in by one end). Such a stock will move freely inside a bottle looking like a whole one. However, to prevent people from seeing the joint, you can attach sticks to the stock which will limit its movements.

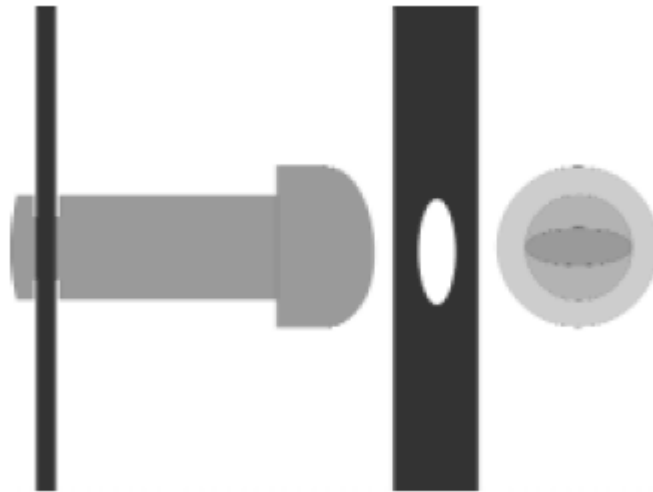
SHIPS IN BOTTLES

Making such a complicated cork requires accuracy and carefulness. Pay attention to the glue you use: it should not dry out until you assemble the model. Also some kinds of glue leave a thick seam which can cause difficulties after applying.

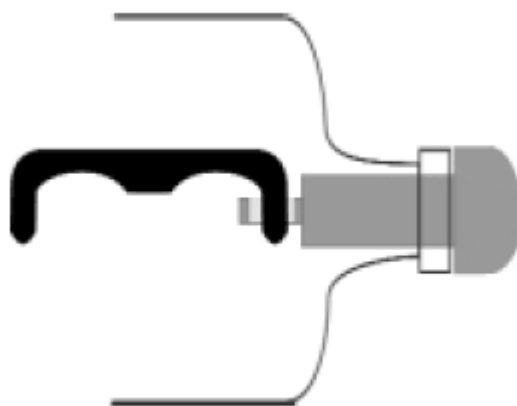
Now let me introduce you a structure that does not require so many efforts.

The secret of it is in the shape of the cork and the hole in it. The stock looks like a plank with an oval hole in the middle; the end of a cork has the same form. When you put the stock on the cork and turn it to 90 °, the structure will be fixed. To keep the stock in place before the cork is inserted, just turn the bottle upside down (pic. 55)

Of course, you will have to make sure the stock remains in its place, though it will not happen if a bottle has a flat or oblong shape.



pic. 55 - The secret of it is in the shape of the cork and the hole in it

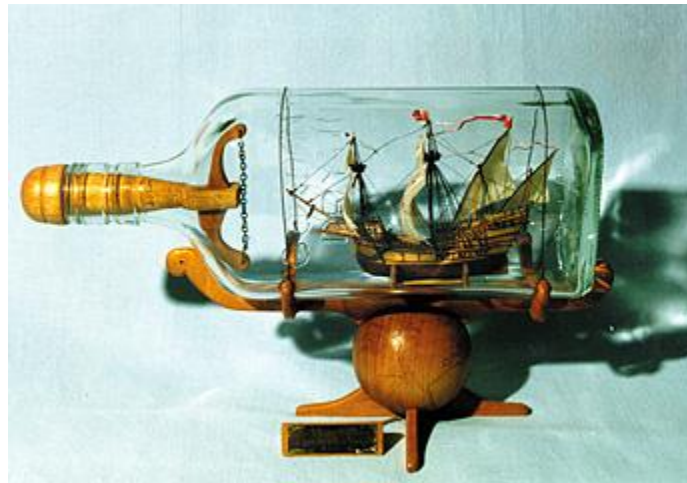
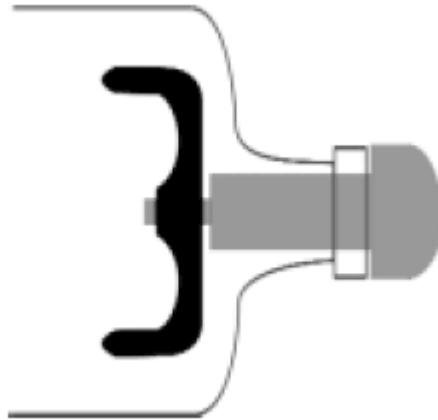


pic. 56 – the construction easily goes inside

And in conclusion, one more effective and at the same time easy structure. The stock in it has a rectangular section; and at first sight it seems that it will be more difficult to insert it inside, but it turns out to be vice versa. The secret is in the shape of the stock (see picture 56). Such a stock can

SHIPS IN BOTTLES

be easily bent forward without being taken out of the bottle opening. After inserting the construction into the bottle, just turn it slightly to put the stock in its place (pic. 57)



pic. 57 - turn the stock slightly to put it in its place

The fact that the stock never leaves the hole in the cork allows you to add some unusual elements to it that gives the whole thing more mysteriousness. It can be a chain joining both ends of the stock, bows, rings, and even little locks made of wood. This construction is also interesting because it doesn't require additional threads since the stock is put into its place by its own weight.

In this chapter I described just major methods of making corks-puzzles; you can invent your own ones by combining them and contriving new shapes.

Unusual ship models in bottles.

A ship-compass.

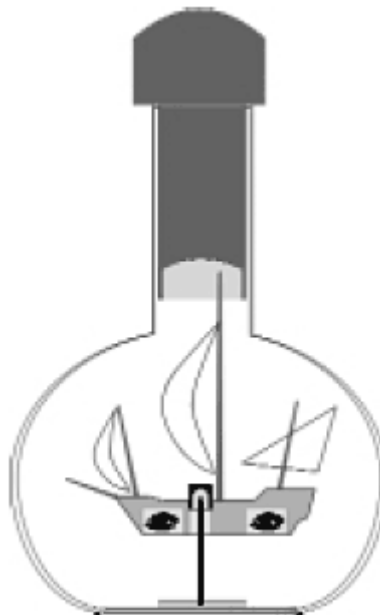
SHIPS IN BOTTLES



From time to time every boat model maker has a desire to create something extraordinary; in this chapter I will reveal some of the methods to make such ships.

What does a compass look like? It is very simple: a magnetized arrow revolves on a non-magnetized needle. Due to the magnetic fields of the Earth, the one end of the arrow always turns to the south, the other to the north. You are going to make the same thing, but a ship model will stand for an arrow (pic. 58).

Besides the model itself, you will need a small magnet and a durable brass or copper pin (or wire). If you can't find a magnet of a necessary size, do not worry – the magnetic fields of the Earth are so strong that you will need only a couple of them to turn the arrow. If you have a large magnet, you can break into pieces by wrapping it into a piece of cloth and using a hammer.



pic. 58 – a structure of a ship-compass

SHIPS IN BOTTLES

Then take two pieces which should fit into a stern and a head part of your model. How to locate the north and the south? Pour some water into a saucer and place a piece of foam plastic there, then place the magnets from the opposite sides of it. After that, turning the magnets in different ways, try to make the foam plastic turn one end to the north and the other to the south. After you find out the poles, mark them with paint.

Now you can make a model which is going to be quite unusual as it will freely revolve on a thin needle keeping balance. Seems impossible! But let's remember a law of physics: a body keeps balance if its center of gravity is lower than the point of support (in your case, you need to make the center of gravity lower than the needle which stands for the point of support).

However, do not forget about friction force: the model should be light enough to revolve freely without pressuring the needle. To sum up, the model should be light weight and its upper part (masts and spars, rigging, sails and shrouds) should be lighter than the lower one (the body itself). Weigh the parts to determine which one is heavier, but take into account that the masts are long and the body is short. This might distort the balance. To avoid that, I'd recommend to make the sails and masts as light as possible.

To make the model stable, raise the point of support as high as possible. You can use a piece of thick copper or brass wire (never use any iron details since they can interfere with the work of the compass; use only non-magnetic materials like wood, copper, brass etc.)

Take copper or brass wire with the diameter of 4-5 mm, grind its butt end and drill a hole with the diameter of 2-3 mm and the depth of 3-4 mm. Cut the wire so that it looks like a reversed glass; it will be a bearing for your ship model.

The body can be cut out of soft wood like lime or pine. Drill a hole in the center of the body with the diameter a bit less than that of the bearing to make the former sit tight on the "glass".

Make openings for the magnets at the bottom of the fore part and the stern-part. Make sure the magnets are not seen and completely fit in holes.

The little wire glass is attached to the top of the body; put it not very deep into the hole in the body. Place one magnet into the hole in the fore part and the other into that in the stern part. Don't forget to point them to the right directions: the marked ends then should look on the same direction, which is either the fore part or the stern part. It is not very important if your ship chooses north or south, but it is crucial that it accurately turns to one of them.

Before gluing the magnets, try to experiment: attach the needle with the point up and place the body on it. Balance the ship by putting pieces of wire on its deck. Check the magnets orientation; if it is wrong, you can use bigger ones.

After the body is ready and the magnets are accurately orientated, it's time to equip it with masts, shrouds and sails. You should choose the method of assembling in advance. Since the size of the ship-compass is about 2-3 cm, the best one will be "the joke" method. It's extremely easy and

SHIPS IN BOTTLES

suitable for miniature models. The construction of masts, shrouds and sails was described above; the only difference is in the central mast which should be taller than usual. Why? The answer is below.

Before you put the model into the bottle, you'll have to perform a few actions. Balance it on the needle with pieces of wire again (those weights can be made in the form of anchors, cannons or chains and should be glued after the balancing); it should sit firmly and be able to turn from side to side.

Now you can make a base for the needle; it can be cut out of wood in the shape of a disk with the diameter less than that of the bottle neck. Make a hole in the middle, insert the needle and stick it to the bottom of the bottle. Polish the tip of the needle with sandpaper to make the ship spin easier; the tip should be sharp and rounded at the same time and should not scratch your nail when you run it across. Actually it would be great if you polish the inside of the glass; however, it is a difficult task which can be done only by a skillful person.

Seems like the model is ready to be put into the bottle, but did you question yourself how you were going to straighten the sails and raise the masts if the ship was not fixed and looked like a vane? That's why you need to secure it temporarily inside the bottle. Use double-faced adhesive tape: take a piece a bit larger than the bottom of the ship and stick it to the bottom of the bottle, then place the model onto it. Such a tape will be enough for that small ship and simple operations. Also, I'd recommend to make the bottom part of the model as flat as possible to make the areas of contact big enough to fix the vessel.

After installing the masts as it was described in the method called "a joke" and fixing the ship inside, remove the model from the tape by using a sharp instrument.

Put the ship onto the needle by gripping by the mast and discard the tape, you won't need it any more.

Check the balance once again; the model should turn freely. If necessary, add some weight.

Now everything seems to be ready, and you can boast with your model to your friends, but imagine a situation if the bottle is turned upside down and the ship jumps off the needle. To avoid that, you have to limit its movement inside the bottle.

How to do that? You remember that the central mast was unusually tall which, together with the cork, enables to keep the vessel in its place. If the bottle is turned upside down, the mast will set against the cork preventing the model from moving further.

As you can see now, all the parts fit each other well. The cork is no exception. As you remember, its main function is to prevent the model from falling off the needle. For that purpose, make a deepening in the butt end of the cork; it should let the ship spin freely yet keeping it from falling.

SHIPS IN BOTTLES

Finally, your unusual model is ready. Of course, it won't be as precise as a real compass, but at least it can show you where it is "not-south".

After learning the method of using a double-faced adhesive tape, you acquired a technique of making other rare models. Here are some of the constructions where a ship is placed in an unconventional position.

Ship hung on chains.



What if you try to make a ship hanging on chains attached to the stock of the cork? It won't be difficult for those who have read this book carefully.

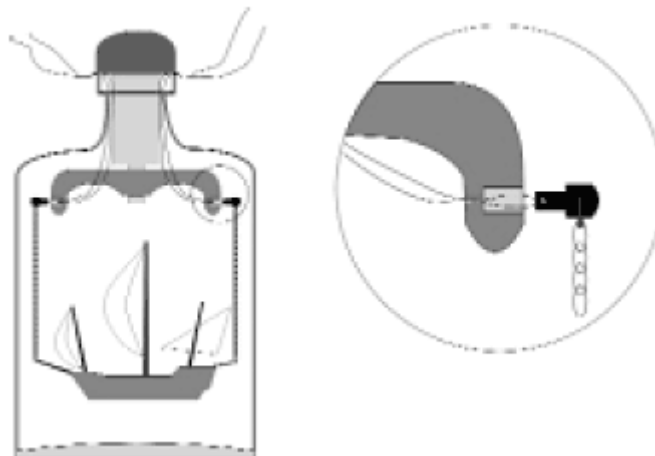
Assemble a model using one of the described methods (for instance, "A Joke"), attach pieces of thin but strong chain to the front (the bowsprit) and the back parts of the vessel. Affix wooden stoppers to the other ends of the chains (pic. 59).

Cut a cork and a stock out of wood like it was described in the chapter "Corks". Drill holes in the ends of the stock for the stoppers, the latter should easily get inside with the glue which will be applied in the last minute.

Also, make openings for fishing line in the stoppers and the holes for them to install all the details inside a bottle. The technique was described in the chapter "Corks". To put it briefly, its point is in putting the fishing line through so that you can install a part in its place by pulling both ends of the line and then remove it by pulling one of the ends.

As you can see, it's simple. The structure is clear from the picture. Assemble the model on the table, cut out a cork and a stock and make sure all the details fit each other well. Remember that during assemble inside a bottle the stoppers will be covered with glue which can make them swell, that is why the whole process should take no more than 5 minutes, otherwise the glue will dry out and the stoppers may not fit into the openings. So try to rehearse this procedure beforehand.

SHIPS IN BOTTLES



pic, 59 – A scheme of a ship hung on chains

Put the fishing line through the holes in the stoppers and the cork, fix the parts of the ship inside a bottle with a piece of double-faced adhesive tape and assemble the model. Remove the tape and , applying some glue to the stoppers, install the construction by pulling the fishing line. Make sure all the details are in their place, and pull out the fishing line. The model is ready.

Ship-cork.

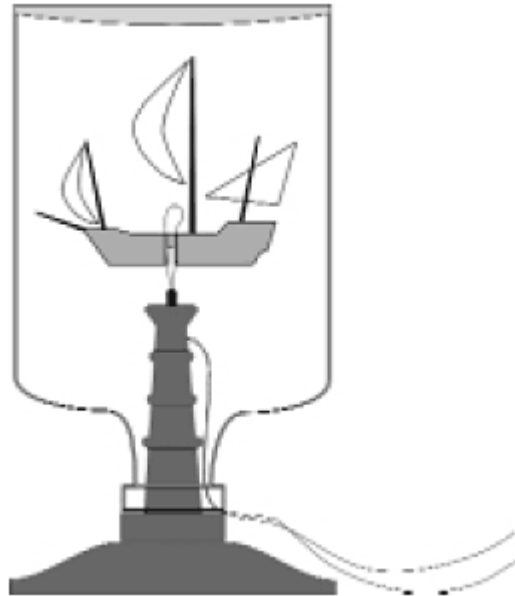


A cork is an essential part of all our ship models in bottles; it is an element of design as well as the ship itself. Let's make them even closer to each other. What if a ship will become a stock which "locks" the bottle from the inside? Your knowledge is already enough to carry that out.

Place a bottle with the neck down; in this case the cork can also be a stand. The model is put on the end of a vertically standing cork.

Make a model using one of the described methods. It will mostly be usual, except for it should sit firmly on the butt end of the cork. For that, make a hole with the diameter of 4-5 mm in the bottom of the vessel and attach a pin to the end of the cork. You will have to join them well to securely fix the model inside the bottle. After that it will be impossible to take it out without breaking it (pic. 60)

SHIPS IN BOTTLES



pic. 60 – a scheme of a ship-cork

The main difficulty in this work is to join the cork and the ship since you will have to do that in almost completely sealed bottle. Here you can use the already known method of using fishing line.

Drill thin openings for the fishing line: it should go through the pin, then go to the deck through the hole in the body, after that return to the hole, but in another way, and go through the pin once again. You will get a loop which will put the model onto the pin if you pull both ends of it, and it will go out if you pull just one end.

Put the fishing line through the openings made for it and make sure you will be able to install the ship onto the cork. Without pulling out the fishing line, assemble the ship using the tape. Then remove the tape, glue the pin and drag both ends of the line joining the model and the cork. Take out the fishing line.

Wait till the glue is dry and seal the bottle. The model is ready.

Stands.

Stands are an important part of a ship in the bottle, and all three – the stand, the cork and the ship - should make a single whole and supplement each other. As a rule, the type of a ship and the shape of the bottle define the form of a stand.

Every boat model maker makes it in a different way, that's why I will only give you some advice without giving you ready solutions.

SHIPS IN BOTTLES

First, fix securely the bottle on the stand; it will enable you to keep the bottle in good shape for years. Otherwise, the ship may slide off the stand and break into pieces; to avoid that, make sure it's fixed well. However, don't glue the bottle to the stand; just tie it with a nice thread or a piece of old-looking copper wire. For instance, you can make miniature shrouds with tiny dead eyes.

Then you need to lift the model of a ship in the bottle above the base of the stand to make it "soar in the air". To reach that effect, you have to attach the frame (on which the bottle rests) to the base of the stand only in one or two spots and then lift it as high as possible. Such a structure will be stable enough if you tighten the joint with a screw bolt and a nut (pic. 63).



pic. 63 – try to lift the model of a ship in the bottle over the base of the stand

The base of the stand can be made of a thick board or turned with a turning machine (pic. 64). You can use beech wood, maple wood or red wood. It's better to make the cork of the same material.



pic. 64

How to Choose a Bottle.

First of all, a model should fit inside a bottle. Moreover, a narrow and long neck will only complicate your work, especially if you are a beginner.

Furthermore, choose a transparent bottle whose glass doesn't have any ripple on the surface since it will hide the model. That's why the glass should be thin and clear; however, any glass distorts

SHIPS IN BOTTLES

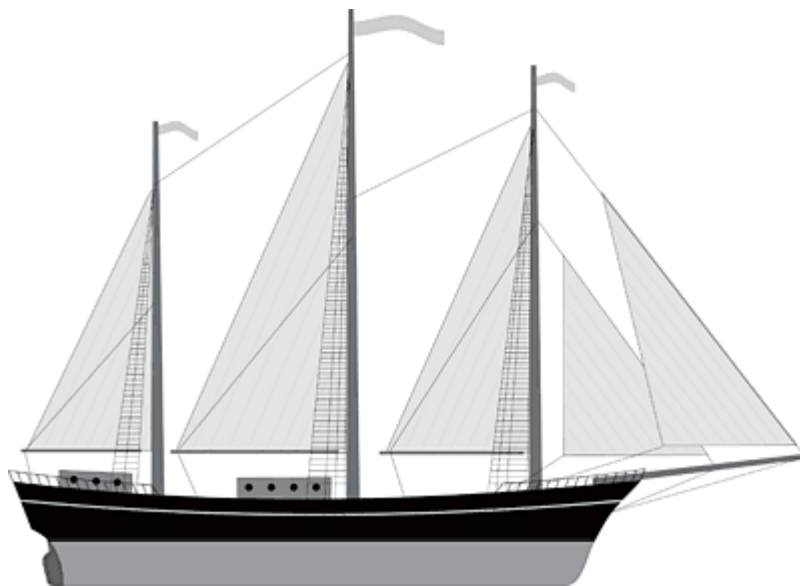
objects (you can easily see it if you insert a checked piece of paper into a bottle), so try to find a bottle with minimum distortion.

I need to say that there are no unimportant details when you work on a model; you will achieve success only with lots of patience and scrupulosity.

How to choose a drawing to make a ship model in a bottle.

Before choosing a master drawing for your work, you have to decide whether you want to make just a souvenir or a miniature copy of a real ship. For the former any picture or photo of a sail ship will be enough; you can even draw it yourself. Don't get upset in case it does not look "very real"; you are the author and you make it look like you wish. A ship in the bottle can look wonderful even if it exists only in your imagination.

For a beginner I'd recommend a simple sail ship with fore-and-aft sails and one or two masts. For example, a schooner (pic. 61); it is easy to make and insert inside a bottle.



pic. 61 – a schooner drawing

If you are a skillful maker, you're less likely to be satisfied with an uncomplicated model, so you can try to create a copy of a real vessel. At least you should try to make it look like a miniature copy. A ready model will fit into your palm. How precise and detailed can be the parts of the ship in miniature scale? All depends only on your skills. Sometimes details can be reproduced on a scale of 1:500 as accurately as on a scale of 1:100.

The more exact drawing you get, the easier your work will be. At times a very detailed drawing makes a maker to reproduce details that are not seen with a naked eye; it is not a reason to blame

SHIPS IN BOTTLES

him or her. Visa versa, if a part is not visible, the whole charm and the fineness of the performance will only benefit from it.

Before starting to work with your model, choose a scale of it; measure the bottle thoroughly – its depth, length and height. Measure the maximum dimensions of the future model, compare them with those on the drawing and calculate the scale.

Make a scale table. For instance, the length of the body of the future model is 100 mm and the length of that on the drawing is 250 mm. Divide 250 by 100 and you will get a conversion rate of 2,5. To draw up a table, you need to divide the figures from 1 to 9 by the conversion rate. In our case we get the following table:

How to use it? For example, a detail size on the drawing is 32 mm. Factorize it into summands 30 and 2. In our table “3” on the drawing corresponds to 1,2 on the model. Because we don’t have 3, but 30, multiply 1,2 by 10 and you’ll get 12. Again, “2” corresponds to 0,8 in the table. Add 12 to 0,8, and you’ll get 12,8. It means that 32 mm on the drawing is 12,8 mm on the model.

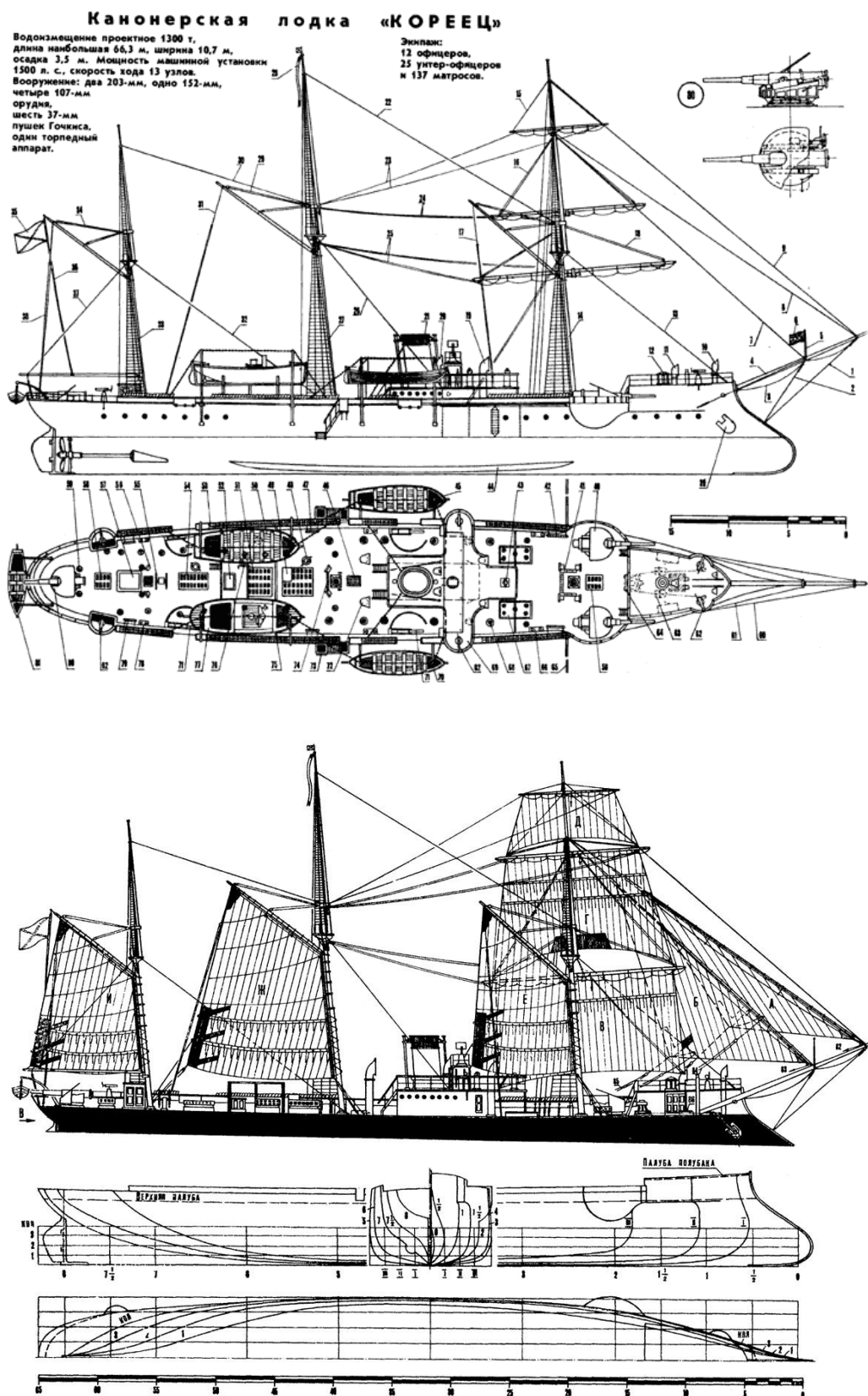
Of course, you can use a calculator and every time divide a number on the drawing by 2,5, but believe me – the calculator is an unnecessary thing on your table. Calculate mentally is faster, and your brain will only benefit from it.

What kind of a ship can I recommend to a skillful model maker? First of all you need to choose a method of inserting the ship into a bottle since the complexity of design depends on a method. The main question you have to answer is into how many parts and in what plane you are ready to cut your ship. If you chose the most difficult way and decided to cut the ship vertically, then any kind – a sailing ship, battleship or papyrus boat – is suitable for you.

If you don’t want to use such a time-taking method and cut the body, choose a sailing ship. Why that one? Of course, it’s not forbidden to put a battleship or steamer inside, but without gorgeous sails they won’t look great. The body of a ship without sails should be very wide to make people see that it’s larger than the bottleneck.

The most complicated models are those with a sophisticated design and masts with sails. For example, such battleships built in the end of the 19th -the beginning of the 20th centuries (pic. 62)

SHIPS IN BOTTLES



pic. 62 – a draft of the gunboat “Koreets”

END