William Rex

Model of a 17th-century warship

Rijksmuseum Dossiers

Contents

WILLIAM REX. A MODEL OF A 17TH-CENTURY WARSHIP

1
As far as is known, the *William Rex* does not represent an actual ship. It is a scale model of a Zeeland warship of the second rate from the end of the 17th century.

A ship for the House of Orange

In 1700 a visitor to the assembly chamber of the Standing Committee of the Zeeland admiralty in Middelburg Abbey had to go up several flights of steps from Abdijplein. There he was immediately confronted with the war at sea in the form of the flags and pennants captured from the Spanish. Awaiting him at the top in the assembly chamber was a veritable maritime panorama. The first thing to catch his eye was a splendidly imposing ship model, which was placed in all probability against one of the short sides of the room (fig. 2). Facing it above the chimneypiece was a monumental portrait of William III, the Stadholder of the province of Holland and King of England, wearing the armour of the Admiral of the Fleet of Zeeland. Also hung there were Ferdinand Bol's magnificent portrait of Michiel de Ruyter, the admiral from Zeeland who was in the service of Holland, and portraits of the brothers Johan and Cornelis Evertsen, who were killed in battles against the English in the second Anglo-Dutch War (1665-1667) (figs. 3-6).

But what attracted most attention was the ship model, which was over 4.5 metres long and so occupied a prominent position in the room. Nowadays this model is known only by an invented name: *William Rex*. No ship of this name is found in the Zeeland admiralty's fleet lists, nor does the name occur in the archive documents to do with the making of the model. In the bills and accounts we find only descriptions such as *the little ship, the showpiece ship* and *the little ship made on a small scale*. The name 'William Rex' first crops up in connection with the model in the 19th century. But first let's look more closely at this name and at what it tells us about

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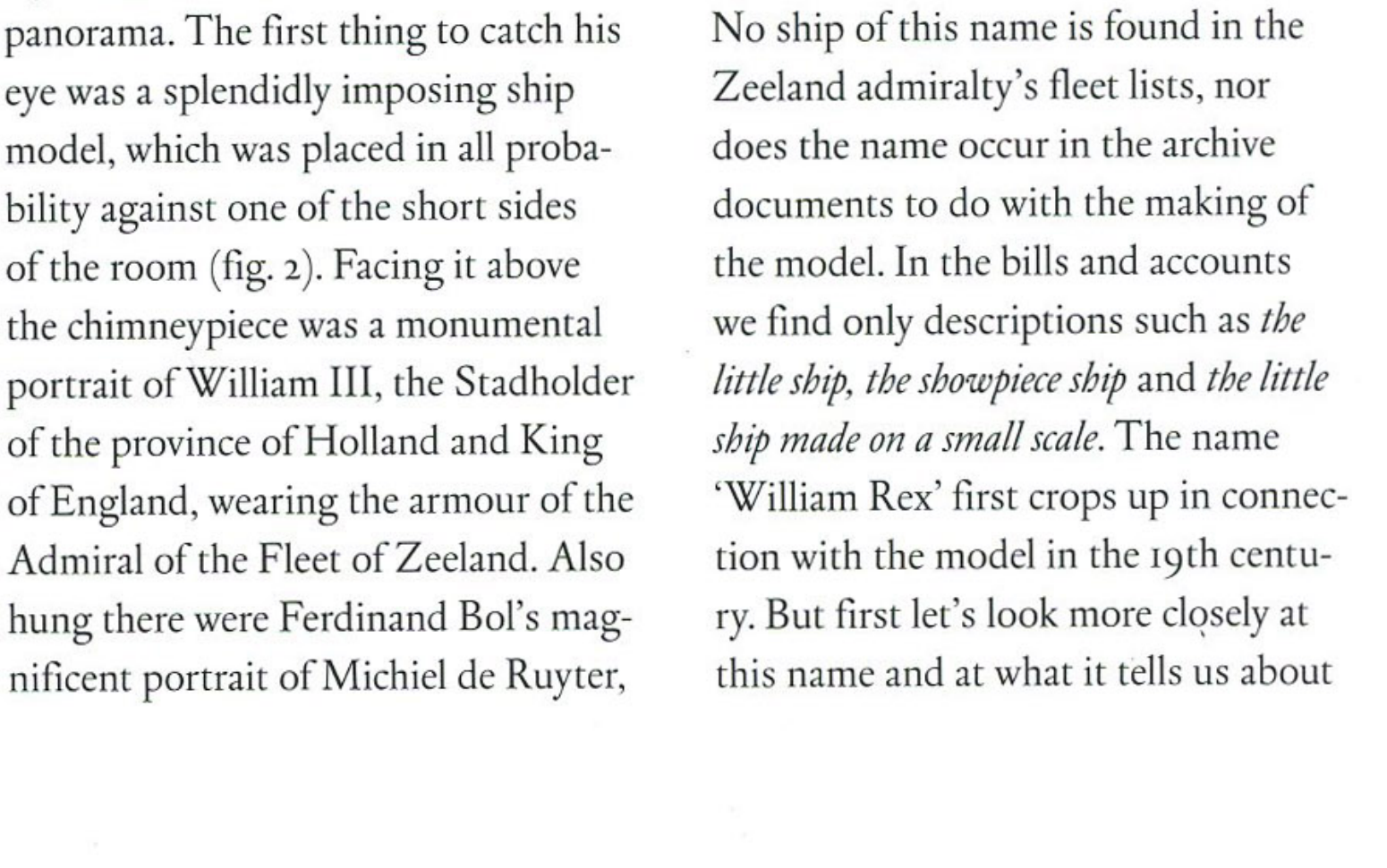
The former assembly chamber of the Zeeland admiralty in Middelburg Abbey, where the model stood during the 18th century. After the building was severely damaged in the Second World War, major renovations were carried out.



3
Godfried Schalcken (1643-1706), *Portrait of King-Stadholder William III (1650-1702)*, c. 1692-1699.
Oil on canvas, 76.5 x 65 cm.

4
Ferdinand Bol (1616-1680), *Portrait of Admiral Michiel Adriaanszn de Ruyter (1607-1676)*, 1667.
Oil on canvas, 157 x 138 cm.

the function of the model and the circumstances in which it was made. The model's decorations provide an initial answer. The arms on the stern display the monogram RWR four times; it probably stands for *Regens William Rex*, King William Reigns (figs. 8, 9). The encircled St. George's Cross (of the Order of the Garter) alludes to the House of Orange. Also seen here are the arms of Zeeland in colour and gold leaf and the date 1698. The figurehead to the fore of the beakhead is interesting too (fig. 10). As usual, the Dutch Lion is depicted, but this lion has a very English look about him, and bears an English crown. This makes it clear for which William the ship was named: only William III, the King-Stadholder, combined the English crown with the stadholderate of the Dutch Republic.

In view of these decorations and the combination with the painting of William III, it is fair to assume that the model expressed allegiance to the House of Orange. Thus it was entirely in the spirit of the States of Zeeland's tapestries in the same building, which were an affirmation of among other things the bond between Zeeland and William the Silent.

Documents in the archives show that the *William Rex* was built in 1697-1698

5
Anonymous, *Portrait of Cornelis Evertsen the Elder (1610-1666)*.
Oil on canvas, 110 x 89.5 cm.
Marinemuseum, Den Helder.
The father of Cornelis Evertsen the Youngest was killed during the Four Days Battle in 1666.

6
Anonymous, *Portrait of Johan Evertsen (1600-1666)*.
Oil on canvas, 137 x 102 cm.
Marinemuseum, Den Helder.
The brother of Cornelis Evertsen the Elder was killed during the St. James Day Battle in 1666.

specially for the assembly chamber of the Zeeland admiralty, which was located in Middelburg Abbey. No doubt the dimensions of the room, about 20 by 7.5 metres, played a role when the scale of the model was decided. If the ship indeed stood against the short wall as we suspect, it would have fitted perfectly between two doors and have been lit by the row of windows in one of the long sides. Another possibility is that it stood on the long side opposite the wall with the windows.

Model or showpiece?

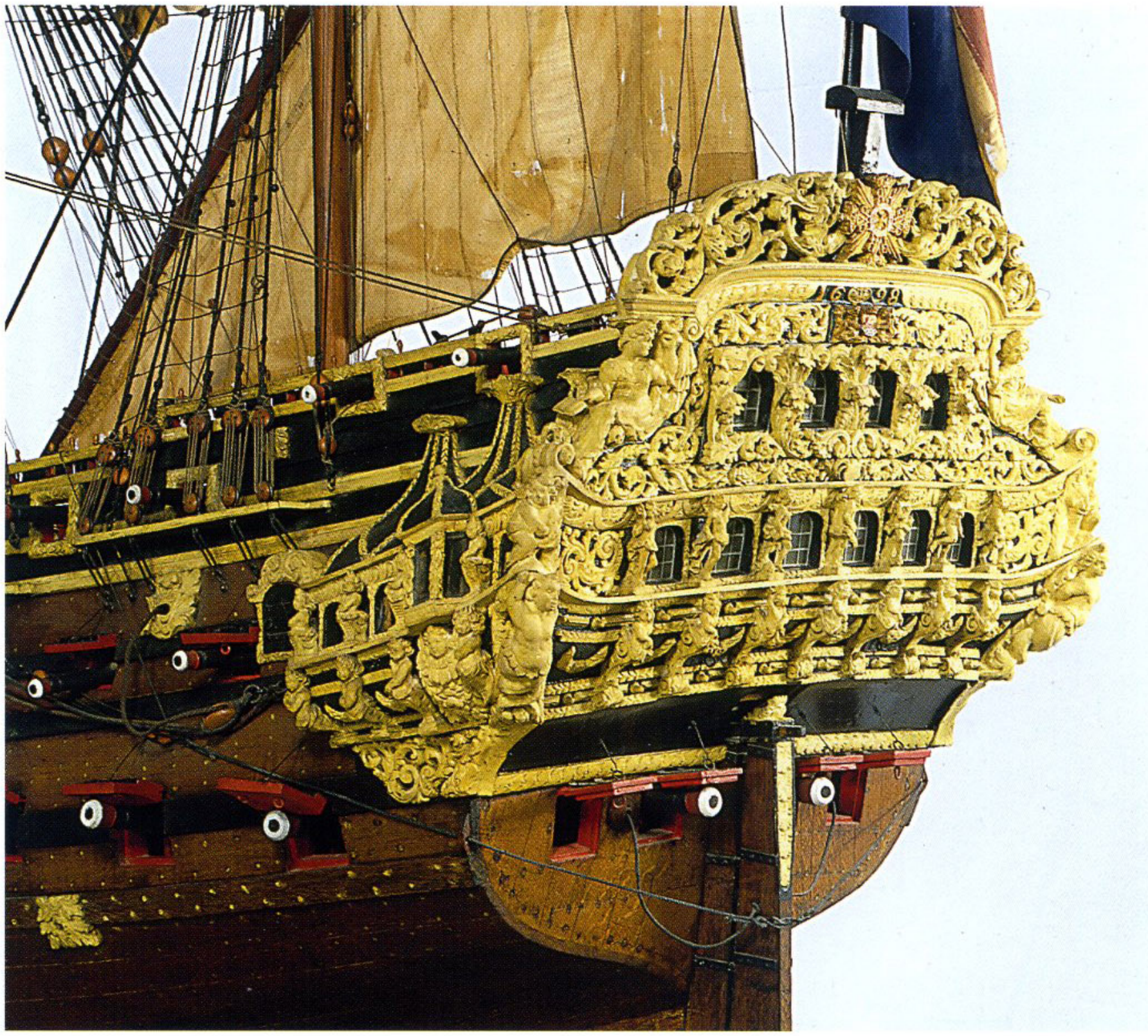
To establish whether there was a link between the *William Rex* and an existing ship, we look at the number of cannon and the dimensions. These tell us something about the rate in which a ship was classed, and with that information it may be possible to link the model to a vessel on the fleet list. At the end of the 17th century there were four classes in the Dutch Republic: ships in the largest rate carried between 80 and 96 pieces (or cannon), those in the second between 70 and 78, those in the third between 60 and 68 and those in the fourth between 40 and 58. Ships with fewer cannon were known as frigates; they were not suitable for fighting in the line but were used for rapid attacks, often carried

7

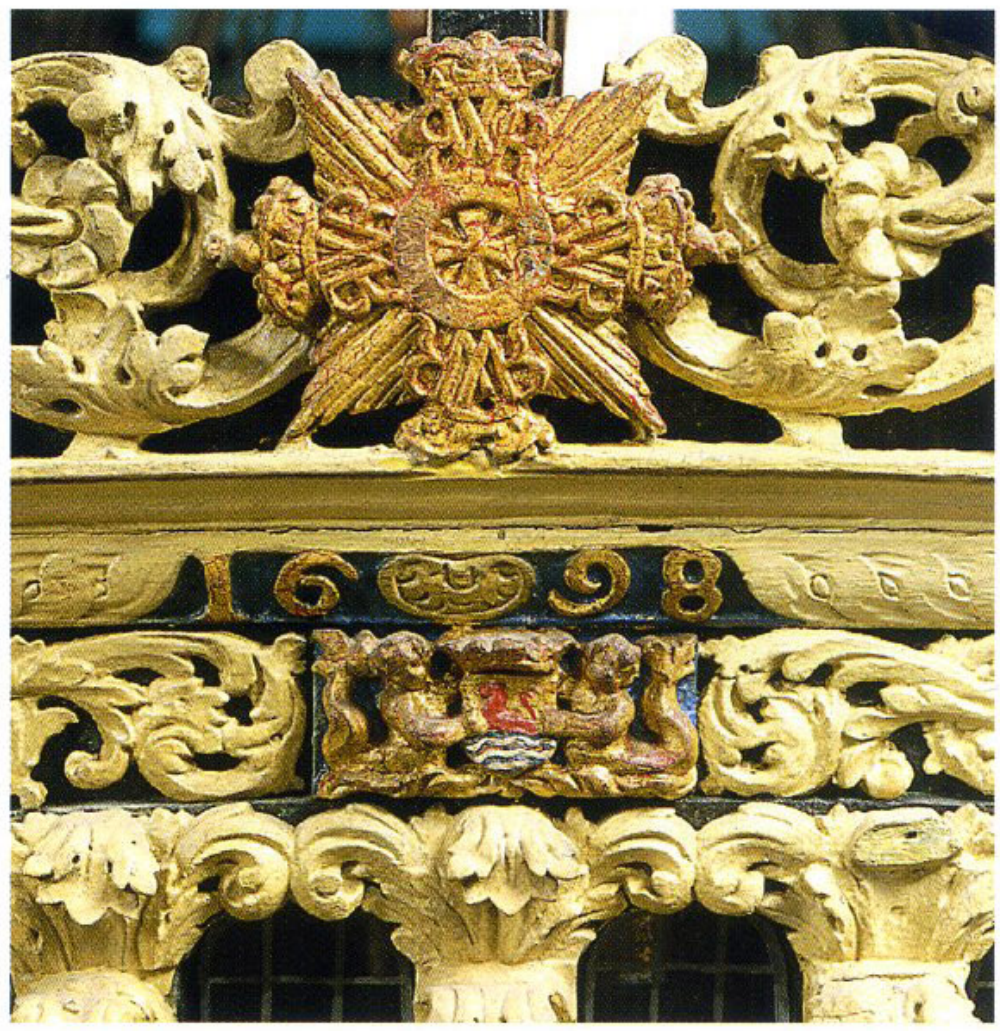
Anonymous, *The Battle in Vigo Bay, 1702* (detail), c. 1705. Oil on panel, 59 x 82.5 cm. Like the *William Rex*, the three-decker *De 7 Provinciën* has its stern painted entirely in yellow.

out without the rest of the fleet. With its armament of 74 pieces, the *William Rex* represents a warship of the second rate. In the surviving fleet lists of the period there are two ships with a comparable armament, the *Gekroonde Burg* of 1682 and the *Eerste Edele* of 1691. Both vessels were 156 feet long (over 45 metres). The arms on the *William Rex* do not, however, fit these names. Another ship, the *Koning William*, might be thought to have served as the model because of its name, but with its length of 170 feet and 90 to 94 pieces it was a ship of the first rate. As far as can be determined, the *William Rex* is not a scale replica of a ship that actually existed, but it does show in every detail how a Zeeland warship of the second rate would have looked in the late 17th century.

The model measures 465 cm 'end to end', that is from the tip of the bowsprit to the boss of the flagstaff at the rear of the poop. In the 17th century, however, ships were measured 'from stem to stern', and the bowsprit, beakhead and overhanging transom were left out of the calculations. Measured in this way, the model is 351 cm long. These measurements are important in determining the scale.



8
The transom of the *William Rex*. In line with the fashion of the day, the carving was painted in a single colour.



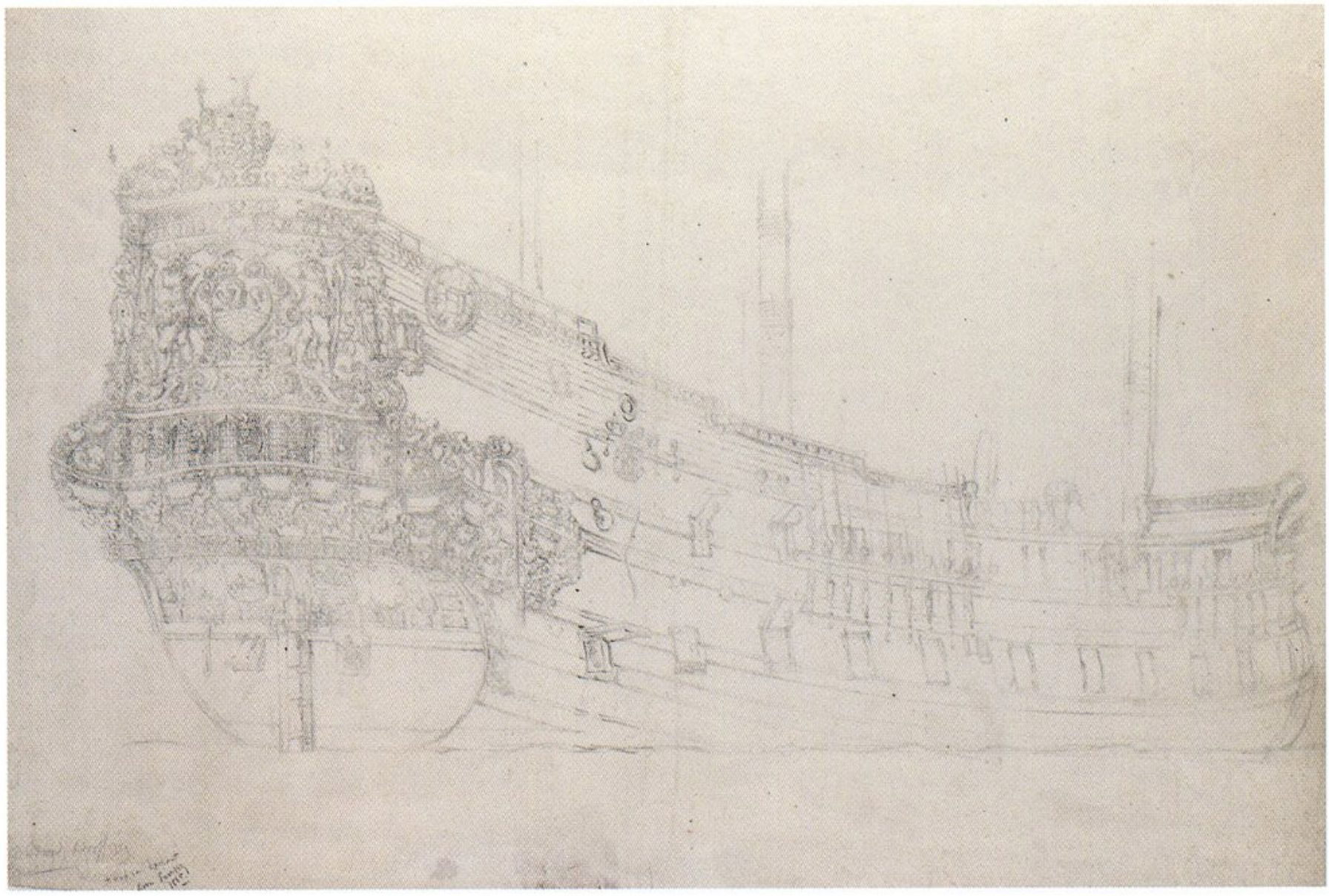
9
The arms on the stern of the *William Rex*. At the top the encircled St. George's Cross (of the Order of the Garter), which refers to the House of Orange, with around it the initials WR four times. Below that, the year in which the model was built and under that the arms of Zeeland.

10
The forward part of the *William Rex* with the beakhead, on which the lion wears the English crown.

According to documents in the archives, the *William Rex* was *146 feet by the small feet measure and 12 feet by the large*. This means that the model is 12 feet long and represents a ship of 146 feet. Given the number of cannon, however, 146 is probably a slip of the pen and should have been 156. The Zeeland foot consisted of 12 inches, so a scale of 1:12 would have been the obvious choice, but that would have produced a length of only 144 feet. If the model represents a ship of 156 feet, which accords with the number of guns, then the scale is 1:13. It is entirely possible, however, that the size of the model was determined by where it was to be displayed in the assembly chamber, between two doors, and that the scale is somewhere between 1:12 and 1:13.

It is not only the size of the model that is striking but also its decoration. In the 17th century the carving on the stern of large ships was rich and exuberant. In the first half of the century the carvers mainly portrayed mythological, biblical and secular themes, but in time the scenes became increasingly decorative, and festoons, floral motifs and acanthus leaves came to dominate, and they are seen in abundance on the *William Rex*. The painting of the carvings also changed. At first the scenes depicted were realistically coloured. Flesh was portrayed with pink paint, and clothing and animal pelts were given the appropriate colours and patterns. This painting was often done by well-established marine artists. It is known, for example, that Reinier Nooms (1623-1668) and Lieve Verschuier (1630-1686) regularly painted carving on ships. In the last quarter of the century there was a gradual change to monochrome painting, in this case yellow, regardless of whether it was a matter of human or animal figures or of garlands, borders or acanthus decorations. In this the painters were closely following developments in contemporary architectural decoration. It was only in the coat of arms, positioned here in the top *hakkebord* or carved transom moulding, that gold leaf and, where necessary, heraldic colours were used.

The shape of the quarter galleries is typical for large ships at the end of the 17th century; they extend over one level and are topped by three small towers edged with festoons. Quarter galleries embellished with single towers first appeared in the 1660s, and then only on the bigger ships such as *De 7 Provinciën* commanded by Michiel de Ruyter. An anonymous painting of the battle in Vigo Bay (1702) shows a later *7 Provinciën* with the same kind of quarter galleries as the *William Rex* (fig. 7). Although we assume that a full-size *William Rex* never sailed for the admiralties, the model is a splendid example of a warship from the end of the 17th century. The shape of the hull, with its rather flat sheer, and the ornamentation are particularly characteristic. At the same time it provides a link between the romantic, high-built 17th-century ships with flat tucks and the more functionally shaped, flatter ships of the line with a round stern of the 18th century.



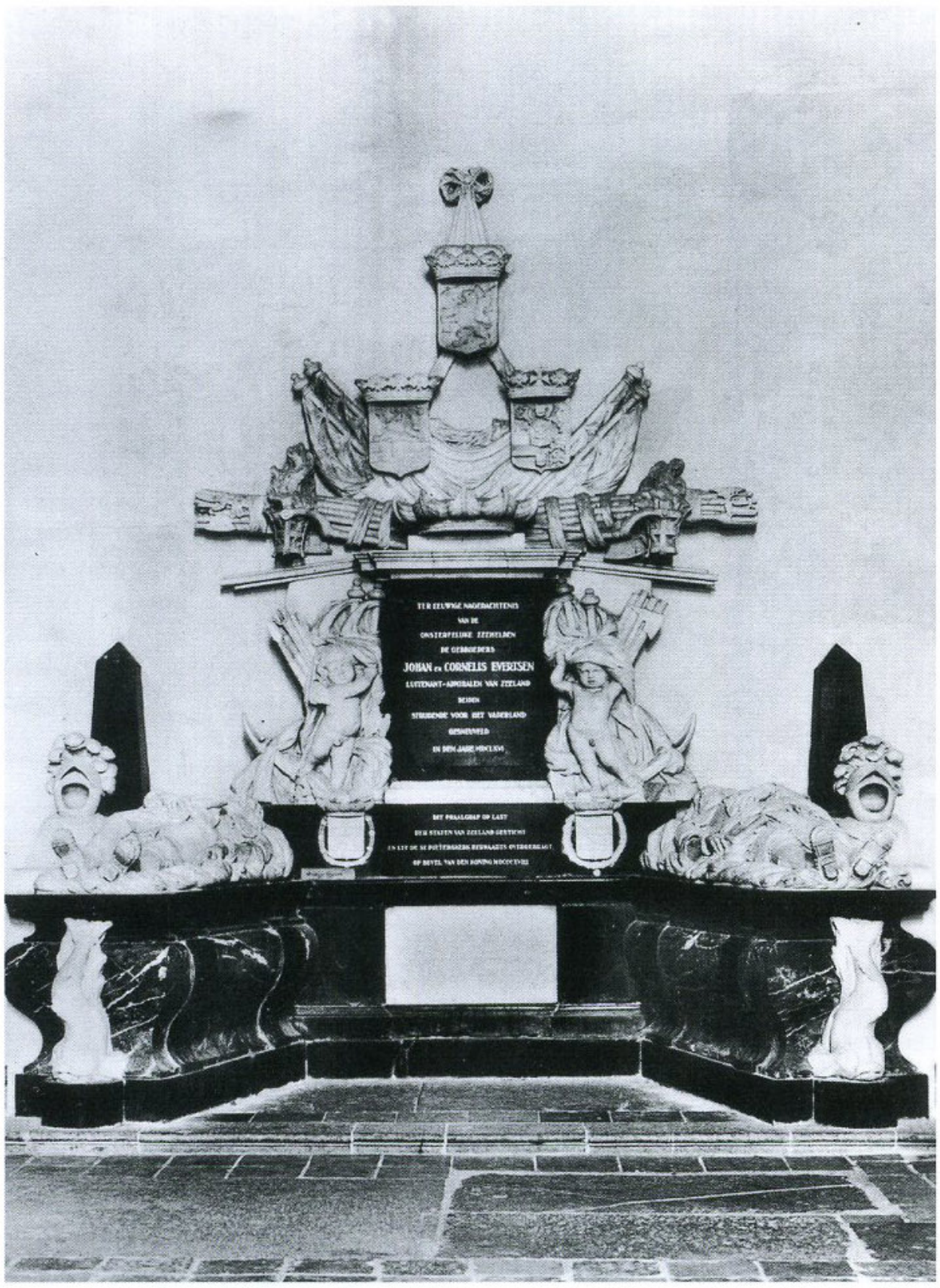
11
Nicolaes Maes (1634-1693), *Portrait of Cornelis Evertsen the Youngest (1642-1707)*, 1680. Oil on canvas, 148 x 124 cm.

12
Willem van de Velde the Elder (c. 1611-1693), *Portrait of the Walcheren*, 1666. Wash drawing, 402 x 516 mm. National Maritime Museum, London. The Walcheren was the flagship of the Zeeland fleet. It sank in the harbour of Vlissingen, probably because of a mistake by Evertsen.

KEES THE DEVIL AND THE STATES OF ZEELAND

Cornelis Corneliszoon Evertsen the Youngest

At the end of 1697 orders were given for the construction and rigging of the *William Rex*. The immediate occasion for having it made was probably the Peace of Rijswijk, which was proclaimed in late October 1697 and ensured a lasting peace with France. William III played a prominent role in bringing this peace about. Admiral of the Fleet Cornelis Evertsen the Youngest (1642-1707), who was in charge of the placing of the model, had not been on active service for several years at the time (fig. 11). He had a reputation for being a fearless fighter and had shown such courage against the French off Beachy Head in 1690 that they referred respectfully to his *glorious defeat*, but in 1691 he had been relieved of his command over the Zeeland fleet. This was in part because he had lost his flagship, the *Walcheren* (fig. 12), through misplaced bravura. Evertsen had a habit of storming into Vlissingen harbour under full sail; then at the sound of a whistle all sails and the anchor would be dropped simultaneously, so that the ship came to a halt with an elegant sweep on the anchor rope. Everyone in the surrounding area of Walcheren would turn out to see 'Kees the Devil' come in. But in 1690 he made a mistake. It is not clear whether the cause was bad timing or a sudden gust of wind, but the *Walcheren*



13
Rombout Verhulst (1624-1698), *Tomb for Cornelis and Johan Evertsen*, 1685.
The tomb originally stood in St. Peter's Church in Middelburg, but in the 19th century it was moved to the Abbey Church.

decoration for the admiralty's assembly chamber was his brainchild. He was not only responsible for the placing of the *William Rex*, but also offered the admiralty the portraits of his uncle Johan and his father Cornelis, *in memory of such laudable figures*. His intention was clear: both the model and the portraits were a tribute not only to the House of Orange and the King-Stadholder, but equally to the Evertsen admirals. Over six generations no less than nineteen members of this family had served in high positions in the Zeeland admiralty and nine of them had died for their country. Thus Evertsen had good reason to be proud. Cornelis Evertsen had earlier shown how much importance he attached to the public commemoration of his family. Shortly after the deaths in battle of his father and his uncle in 1666, the States of Zeeland resolved to erect a monumental tomb for them in St. Peter's Church in Middelburg. To Evertsen's annoyance, the implementation of this plan was postponed time after time for financial reasons, until in 1679 he and his brother lost patience and proposed that they themselves should advance the money required, 6000 guilders. In 1680 the sculptor Rombout Verhulst (1624-1698) was indeed commissioned by the States to design and build a tomb. Verhulst completed the monument in 1685 (fig. 13). But this did not bring to an end the friction between Evertsen and the States of Zeeland. A dispute arose over the inscription on the tomb. The States had decided to commission a lyric poem in which Admirals Tromp and De Ruyter also featured. Evertsen

just touched the harbour mole and sank amid a cloud of flapping canvas and horrific cracking sounds in the middle of the harbour, before the eyes of half the province. It was an ignominious drenching which led to Evertsen being put on trial; he was acquitted at the intercession of his close friend King-Stadholder William III.
Cornelis Evertsen's role was not restricted to overseeing the rigging of the model, as was long thought. In fact, almost the whole programme of

would not agree to this and insisted on an inscription dealing solely with his father and uncle. The outcome was embarrassing: the cartouche on the tomb remained for ever blank. Just as embarrassing was the fact that the quarrel between Evertsen and the States of Zeeland persisted and resulted among other things in the advance of 6000 guilders never being repaid. When Evertsen died in 1707, none of the members of the States thought it necessary to attend the funeral.

The admiralties

To modern eyes the admiralties appear to occupy a curious position in the 17th- and 18th-century system of government. The nation now known to us as the Netherlands was originally no more than a loose form of cooperation between regions or provinces that were dominated by cities. This cooperation was by no means born of altruism. The provinces joined forces of necessity to defend themselves against natural and political enemies, and in this way regulated many matters multilaterally. The Dutch Republic itself had no fleet, but a number of its provinces did. Land provinces such as Utrecht, Gelderland and Brabant had less at stake on the sea than, for example, Holland, Zeeland and in part Groningen and Friesland. For this reason Holland, Zeeland and the north each maintained its own fleet. In times of emergency, when the whole country was threatened, the other provinces had to help pay the costs by means of 'generality subsidies'. After all, they benefited from the actions of the fleets, even if they didn't have one of their own.
Because of the extent of its territory, the province of Holland was divided into three regions as regards the fleet: Amsterdam, the Maze (Rotterdam) and the North Quarter (Enkhuizen or Hoorn), by which was meant the north of the modern province of North Holland. The Republic thus had five fleets. The largest was that of Amsterdam, followed by Zeeland, after which came Rotterdam and finally the two smallest, the North Quarter, whose admiralty was located in Enkhuizen and in Hoorn alternately, and Friesland and Groningen, whose college was first in Dokkum and later in Harlingen (fig. 14).

14
The principal admiralty was located in Amsterdam (1). After it came the admiralties of Zeeland in Middelburg (2), the Maze in Rotterdam (3), the North Quarter, which alternated between Enkhuizen (4) and Hoorn (5), and Friesland, which at the time of Cornelis Evertsen was in Harlingen (6).

15
Willem van de Velde the Elder (c. 1611-1693), *The Battle of the Sound, 8 November 1658*, 1658. Oil on panel, 97.5 x 141 cm. The fleets of the admiralties were deployed not only to mediate in conflicts far beyond the Netherlands, as here between Sweden and Denmark, but above all to protect its commercial interests.

The fleets were administered by admiralty colleges made up of leading citizens on the Standing Committees. Command was entrusted to an admiral of the fleet, a vice admiral and a rear admiral. At times there were several admirals of the fleet for each college and they continually tried to take the wind from each other's sails. The Prince of Orange, as admiral-general, was formally at the head of the United Staffs, but if the fleets had to be combined in order to operate together, actual command was delegated to one of the admirals of the fleet. In 1795, with the advent of the Batavian Republic, the admiralties were dissolved and replaced by the centrally controlled Royal Navy.

It would be stretching the truth to say that the admiralties were always great friends. Cooperation between them was sometimes problematic even in time of war, and it was not always plain sailing in peacetime either. In general there was a great deal of envy between the various colleges and each was anxious to ensure that none of the others

obtained rights it did not have. For example, as the largest admiralty Amsterdam often demanded that an Amsterdammer should be appointed admiral of the fleet with command over the combined fleets, even when there was an obviously better candidate, but with the disadvantage that he came from Zeeland. In the 17th century Zeeland had a highly important admiralty and the province was inclined to view the Zeeland fleet as the navy of a sovereign country. The Zeelanders were excellent seamen and many of the greatest admirals were scions of Zeeland families: Michiel de Ruyter, Joost de Moor, Adriaan and Joost Banckert and the Evertsens, of whom Cornelis the Youngest was perhaps the most colourful.

In the third quarter of the 17th century the Republic fought an economic and military battle with England, which was vigorously contesting Dutch hegemony on the seas. After William III, who enjoyed great popularity in Zeeland, crossed to England from Hellevoetsluis in 1688 and carried out a successful coup there, the fleet of the arch-enemy England and that of the Republic were combined. The former belligerents had to act together to oppose Louis XIV's expansionism and the operations of the Barbary and Dunkirk pirates, which were having a damaging effect on trade. The Dutch played an important but always subordinate role in this: William III had decided that the United Provinces should concern itself with defending the national frontiers and should maintain a strong army for that purpose, while England would be in charge of the war at sea. Thus the combined Dutch-English fleet was invariably under English command and the task of the Dutch was to obey orders. All this was in stark contrast to Zeeland's age of glory as a maritime power.

THE WILLIAM REX AND OTHER 17TH-CENTURY SHIP MODELS

The construction of a ship model

The 17th century was the period in which the Netherlands became a maritime power, so one might expect that this rapid expansion would have led to many models being built. This may indeed have been the case, but very few have come down to us. Besides the *William Rex*, the Rijksmuseum has several other important models. A very well-known one is the *Prins Willem*, the model of an East Indiaman of 1651, which stood as a showpiece in the assembly room of the East India Company's Zeeland chamber and thus fulfilled a similar function to the *William Rex* (fig. 16). No less stately is the model of an unknown warship which was recently restored to its former glory (fig. 17). It is dated 1648 and probably represents a directors' ship from Hoorn. Directors' ships were warships that were not built for the admiralty but were instead paid for by a city and served as escorts of fishing and merchant fleets.

Unlike real ships, which were built of oak imported from all over northwest Europe and traded, the *Prins Willem* and the directors' ship from Hoorn were both made from a single block of limewood: thick and thin planks

16

The *Prins Willem* (1651) is the oldest model of an East Indiaman belonging to the Dutch East India Company.

were glued together to make one block, which was then hewn to the required form. They have solid hulls, and the construction has nothing in common with how a ship was built in reality. The model maker was concerned solely with the visual representation of the ship. Only a few 17th-century Dutch models are known in which this is not the case, among them the *William Rex*.

The construction of the William Rex

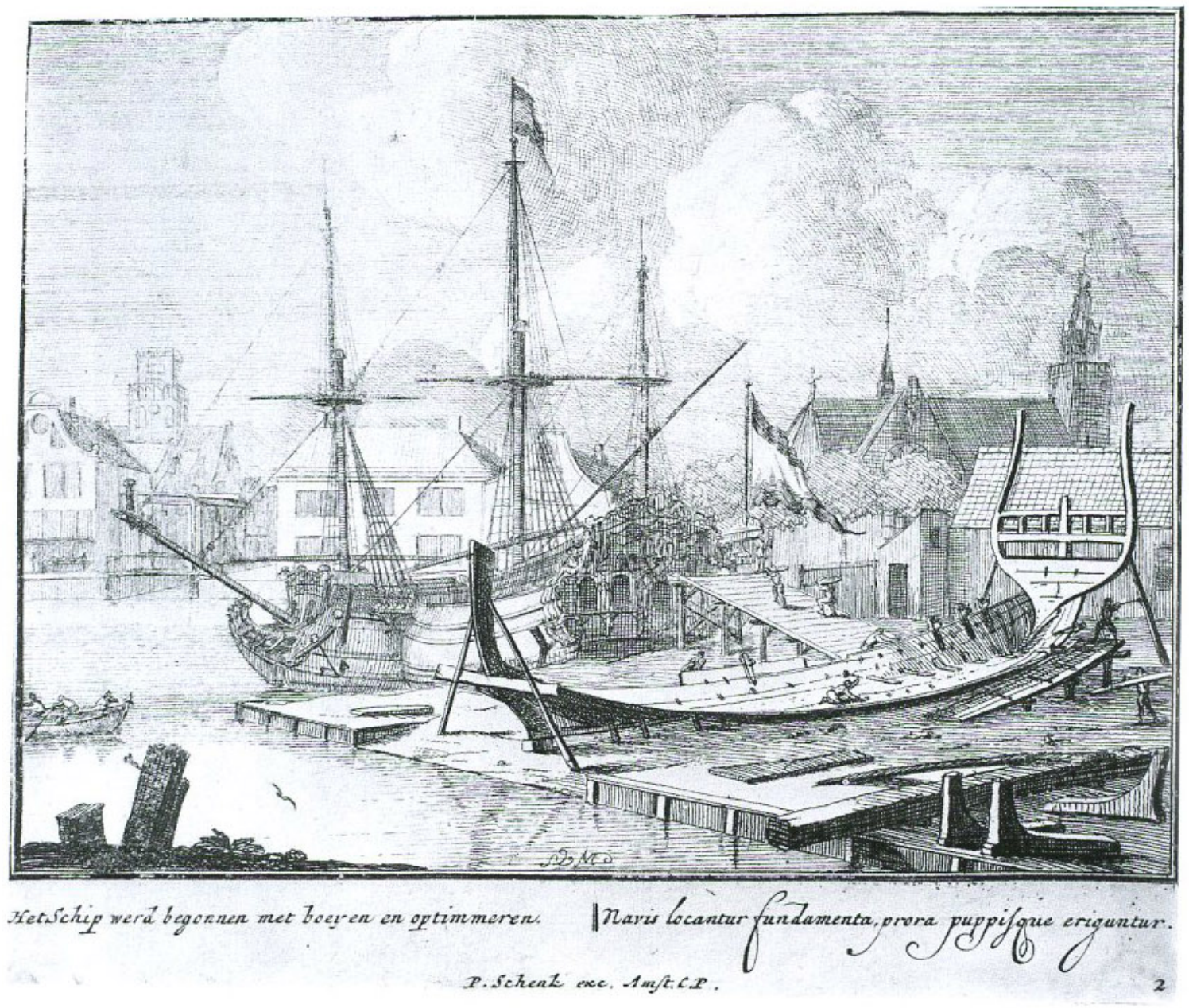
Close examination of the *William Rex* shows that its construction cannot have differed from that of a real ship. It was built by ordinary shipwrights who on this occasion did their work on a smaller scale. And because of its substantial length of 4.5 metres that was not a problem. Indeed, the size prevented the use of simpler modelling solutions, such as cutting out of solid wood. Blocks of wood over 4 metres long and 1.5 metres wide and deep are quite inconceivable and almost impossible to work with.

The building of such a model was a process providing work for many, just as 'big shipbuilding' was. The hull of

17
Model of an unknown Dutch warship of 1648.

the *William Rex* was built in 1698 in the arsenal at Vlissingen to a design by the head shipwright of the admiralty yard, Adriaen de Vriend. He died in August of that year, i.e. while the model was still under construction. That would not have caused any delay, however, because he no doubt left the actual building to craftsmen employed by the yard. He would only have laid down the lines and the dimensions. After his death his colleague and successor Adriaan Davidsen would have overseen the completion.
The model, still without its rigging, had to be transferred from the Vlissingen arsenal to Middelburg Abbey. Jacob Jacobsen received 8 sixpences and 6 farthings for transporting the ship by horse and cart. The masts and rigging were added in the assembly chamber itself because otherwise the model could not have been got through the door. The rigging was made by Pieter Maertens and Jacob Louwerissen, who were paid 36 Flemish pounds (one Flemish pound was worth 6 guilders, at that time about one week's wages). Jacobus Dront received 10 pounds for making

18
Sievert van der Meulen (?-1730),
The ship was begun by building up the sides with planks.
Drawing, 188 x 158 mm.
Here one can see clearly how the outer shell of a ship was built on the slips without first setting up frames.



5 anchors, of which 3 survive. The widow of David Welhelmi asked for permission to have the flax needed to make the sails sent from Bruges. This was initially refused by the States because of the political situation, but later granted. Lastly, the carvings were done by the sculptor Cornelis Moerman for 24 pounds.

Building without a drawing
Looking at the beautiful lines of a model like the *William Rex*, it is hard to imagine that in the 17th century not only this model but also all real ships were built without a draught made in advance. Yet shipwrights succeeded in producing ships purely on the basis of the specifications, which set out the customer's wishes, and of their experience with previous vessels. This experience was enshrined in a great many rules of thumb, all in the form of proportional measures: for a ship 100 feet long the breadth was a quarter, thus 25 feet, and the draught a tenth, or 10 feet. To determine the thickness of the inside of the stem, they reckoned an inch for every 10 feet of length, thus 10 inches. The breadth of the keel was one and a half times the inside of the stem, the thickness of the frames was three quarters of that and the thickness of the hull planking a quarter. Thus each measure was indirectly derived from the main dimensions

of the ship. But of course a ship could not be built only by knowing the thickness of the various components. These days frames are first placed on a keel, and then covered by planking. To determine the shape of these frames, a drawing is made. In contrast, the 17th-century shipwright simply began building the outer skin, plank by plank beside the keel, which rested on short posts and was held together by clamps temporarily nailed on. With his carpenter's eye he determined whether the form seemed right, and in the case of doubt it was always possible to remove the last addition and correct something, until everything was satisfactory (fig. 18).

It was only after a 'shell' of wood had been created that the builder began to add internal strengtheners. The shape of these athwartship frames followed that of the clamped planking. The shell filled with frames was then covered with planks on the inside and only then were vertical wooden pieces added at some distance from each other. Their lines were faired by means of laths. Only when the whole ship was filled with these *oplangen* or futtocks were the two deck clamps, which were to carry the deck, fixed to the interior on either side. The deck beams were sunk into these clamps, which gave the ship great strength. The superstructure followed the same system of futtocks faired by laths, which were then covered with planks and inside which a second deck could be added. Lastly, the sides of the ship were sealed and it could be launched.

The dimensions of the masts and the rigging were just as tied to proportional rules of thumb as those of the components of the hull. The length of the main mast was determined by adding the draught in the hold to the width of the ship and doubling the result. The other masts and topmasts in turn bore a fixed relation to the main mast: the foremast was nine tenths of its length and the mizzen mast three quarters. These days we know fairly accurately what was involved in the building process, but it is still almost incredible that a full-size ship of the same type as the *William Rex* could be built with no more than 40 to 50 workers and inside six months, from tendering to delivery. Examination of the model reveals that it was built with enormous skill and that all its components are made in the correct 17th-century proportions. Not only is it a faithful copy of the appearance of a large warship at the end of the 17th century, it also contains a wealth of detail telling us about the construction techniques used to build a full-size ship. It differs from reality only in its dimensions.

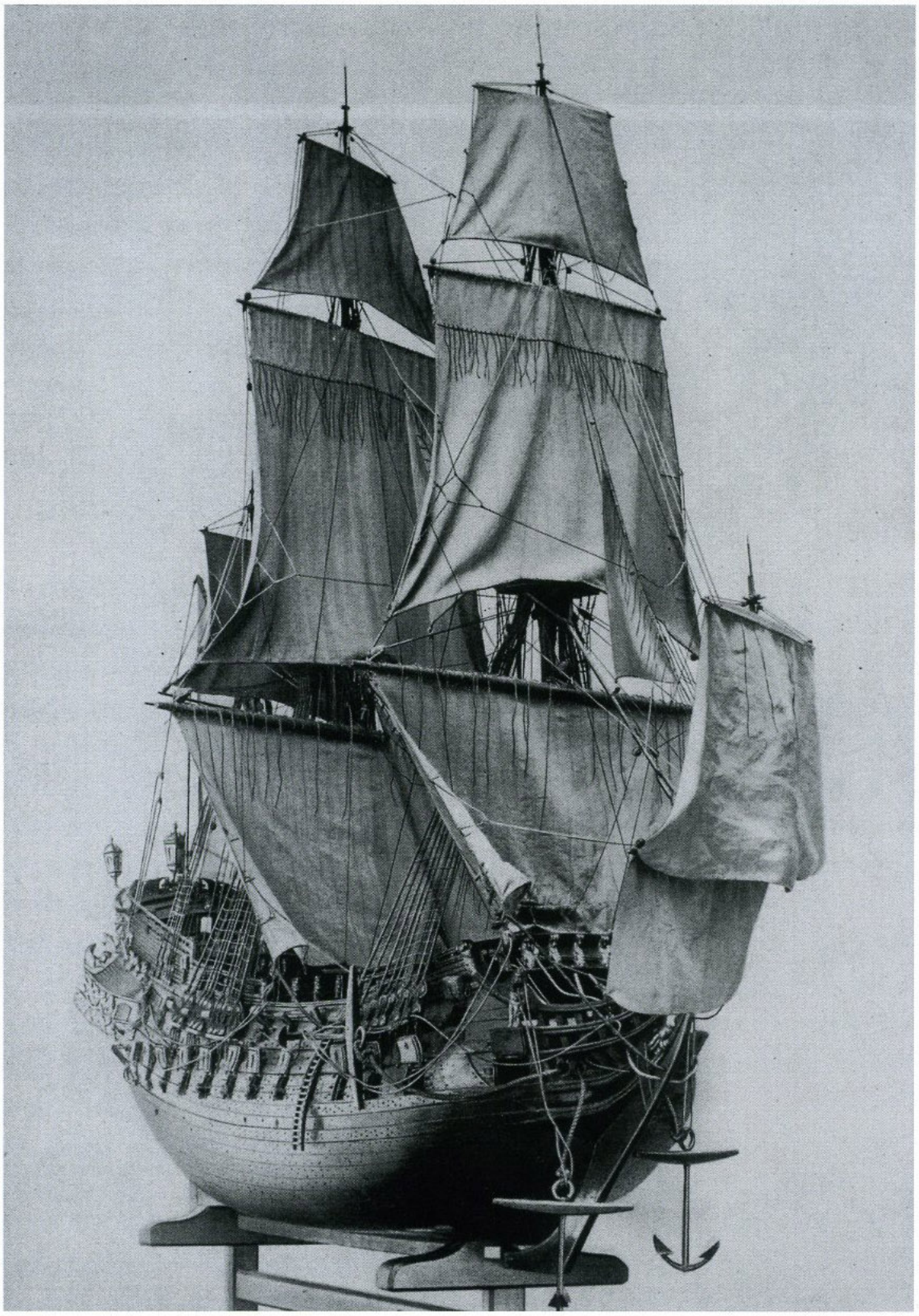
Other ship models

Ship models from the 17th century are few and far between, while authentically constructed models from the period, such as the *William Rex*, are extremely rare. Around 1660 the Elector of Brandenburg, Friedrich Wilhelm II von Hohenzollern (1640-1668), was keen to establish a fleet of his own and consulted Dutch shipwrights. A substantial part of the national income of the Dutch Republic derived from arms sales of various kinds and the Elector's interest was seen as offering attractive commercial opportunities. For this rea-

son he was presented with a large model (2.67 metres long) of a Dutch two-decker by way of furthering customer relations (fig. 19). The model, known as the 'Hohenzollernmodel', was lost during an Allied air raid on Berlin in the Second World War.

A similar model, 2.60 metres long from stem to stern, is in the Bijlokemuseum in Ghent (fig. 20). It too is an historically accurate, 17th-century ship with a flat tuck. Over time, however, fairly drastic changes have been made to its appearance. It was

19
The model of a Dutch two-decker (the 'Hohenzollernmodel') which was related to the *William Rex* in that its construction was historically accurate. Until the Second World War it stood in Monbijou Castle near Berlin. As a precaution it was moved to a warehouse in Berlin, where it was lost during a bombing raid.



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In the Bijlokemuseum in Ghent stands this splendid contemporary model of a Dutch warship, which like the *William Rex* was built on frames.

21
The model of the *Hollandia* in the Netherlands Maritime Museum Amsterdam. Although much smaller than the *William Rex*, this model too was authentically constructed.

not unusual in the past to modernise an old model that was due for restoration and to make its decoration and rigging conform to the norms of the day. The Bijloke model has suffered severely from such interventions, but is now once more close to its original state.

Lastly, there is the model of the *Hollandia* in the Netherlands Maritime Museum Amsterdam (fig. 21). This represents a warship from about the third quarter of the 17th century. It is 1.61 metres long and looks superb, but it has lost something of its authenticity as a result of fairly radical restoration at the beginning of the 20th century. The *William Rex*, measuring over 4.5 metres, seems to have withstood the ravages of time and that alone may be considered remarkable.

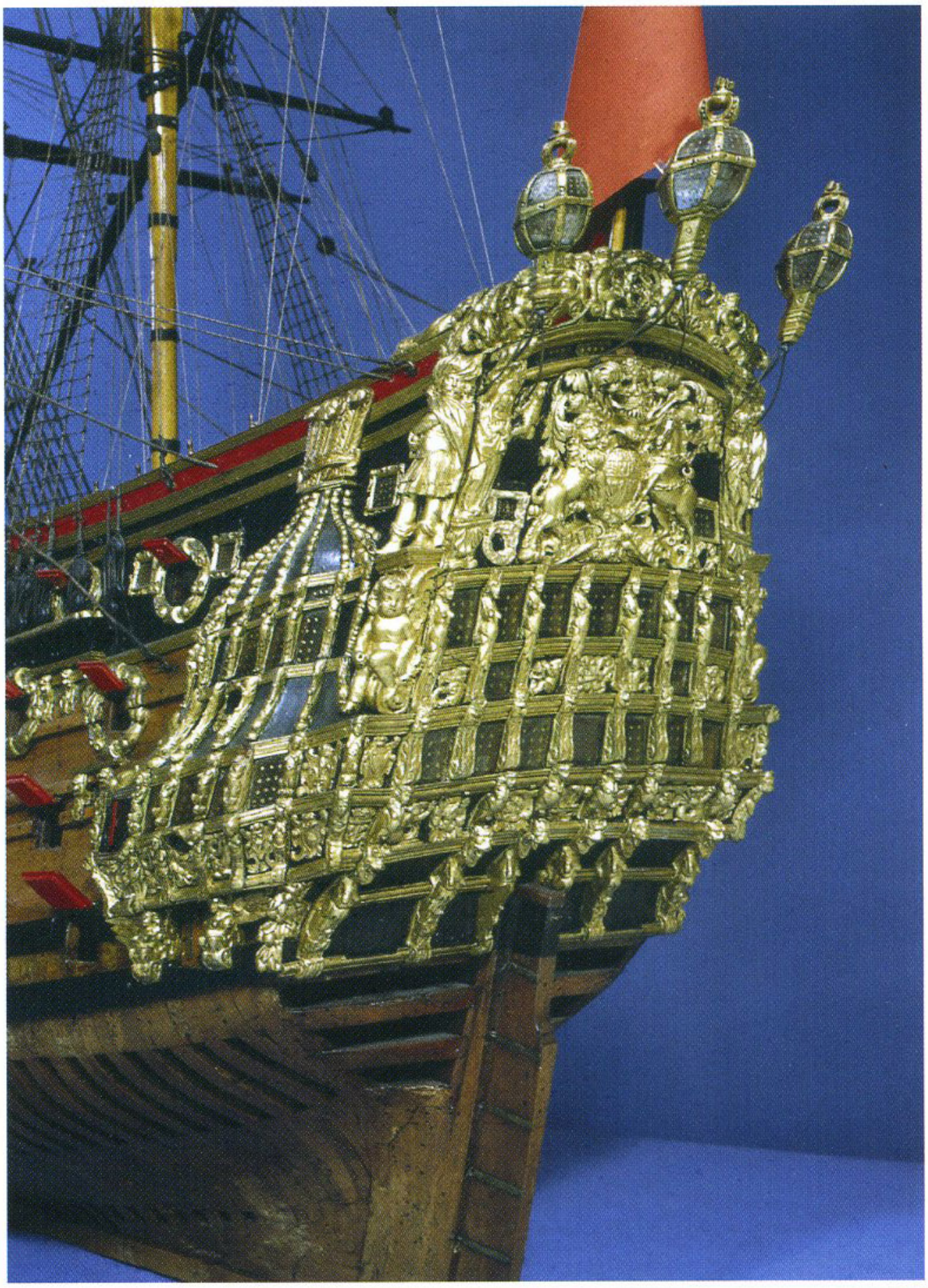
THE FUNCTION OF SHIP MODELS

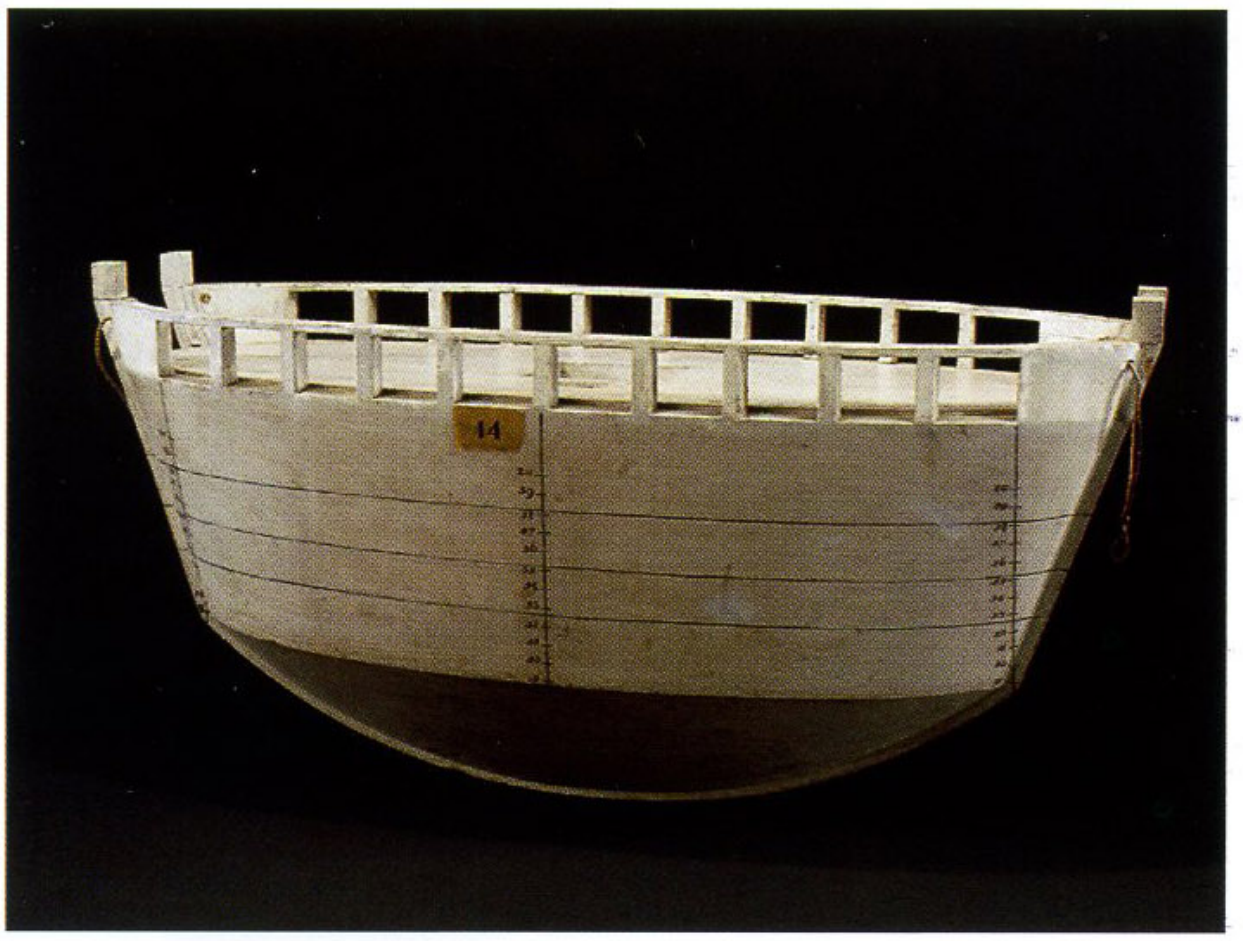
From advertising to status

Ship models were highly valued well into the 19th century, but less so in the 20th century. Their historical and artistic importance was no longer appreciated and this part of the national heritage was neglected and misused. Fortunately, the tide has turned and the value of authentic models is now acknowledged. At auctions, where they are seldom seen, they fetch high prices.
A ship model is an exceptionally complex and at the same time completely useless object. Although the builder has gone to great lengths to produce a replica of a vessel and has invested years of his life as well as knowledge, effort and money to make the hull, the anchors, the cannon, the decorations and the rigging a smaller version of the original in every detail, his ship will never see water and will never fulfil the functions of a real ship, the transporting of people and goods. Yet someone must have a reason for making such a model.
For a long time it was customary to hang ship models in churches for religious or superstitious motives. And even in the tomb of Tutankhamen (14th century BC) ship models were found that had been given to the deceased for similar reasons. There is a ship model dating from the early 17th century that was made by the English shipbuilder Phineas Pett and presented to Prince Charles, later Charles I (1601-1649), as a toy. But often the reason is more down to earth and the making of a model can be explained by commercial motives, as was the case with the *Hohenzollernmodel*. In England, for example, where model building already flourished in the 17th century, models served to persuade the Navy Board to order a full-scale copy. These so-called Navy Board Models are exceptionally beautiful, not least because the planks of the hull and decks were often partly or wholly left out, so that one could see into the interior with all its details (fig. 22). Building such models was a highly specialised craft.
In the Netherlands models were not generally built for commercial reasons. The admiralties all had their own shipyards and did not need to solicit orders. The fact that models were nonetheless built in the 17th century was largely due to notions of status and a desire to show off (and the affluence that made that possible), the same motives that led individuals and organisations to order civic guard paintings like the *Night Watch* or large tapestries. The possession of an imposing painting or a splendid ship model conferred status. The use of models in a room where an important body assembled was not uncommon. We know that ship models played a role in the decoration of the rooms where the East India Company's executive, the *Heeren XVII*, met. A model as a tribute to a ruler or a family of admirals, as we assume in the case of the *William Rex*, is highly unusual, however.
It was not until much later, in the 19th century, that models were made, for example, to represent inventions three-dimensionally for the patent office or a possible investor. Indeed, they were often not models of complete ships, but of components: rudders,

masts, mast tops, galleys, and so on. Models were also built for experiments or practice. For example, the hydraulic engineer Jan Blanken (1755-1838) made a model of a caisson to test the floating properties of this unusual form (fig. 23). The Navy trained cadets in the working of a ship's rigging with the aid of large models (fig. 24). Models were even built as three-dimensional, technical accounts of spying expeditions. Thus at the end of the 18th and beginning of the 19th century various Dutch marine engineers returned from 'study tours' of France, England and even America with models of ships and ship's components which they considered to be of sufficient interest to be shown to the naval authorities (fig. 25). Ship models were also used as business

22
Model of the *Prince*,
late 17th century.
Science Museum, London.
This is a fine example of
a cut-away 'navy model'.





23
Model of a caisson that was intended to close off the dry dock at Hellevoetsluis. The model was used by Jan Blanken, the designer of the dock, to test the buoyancy.

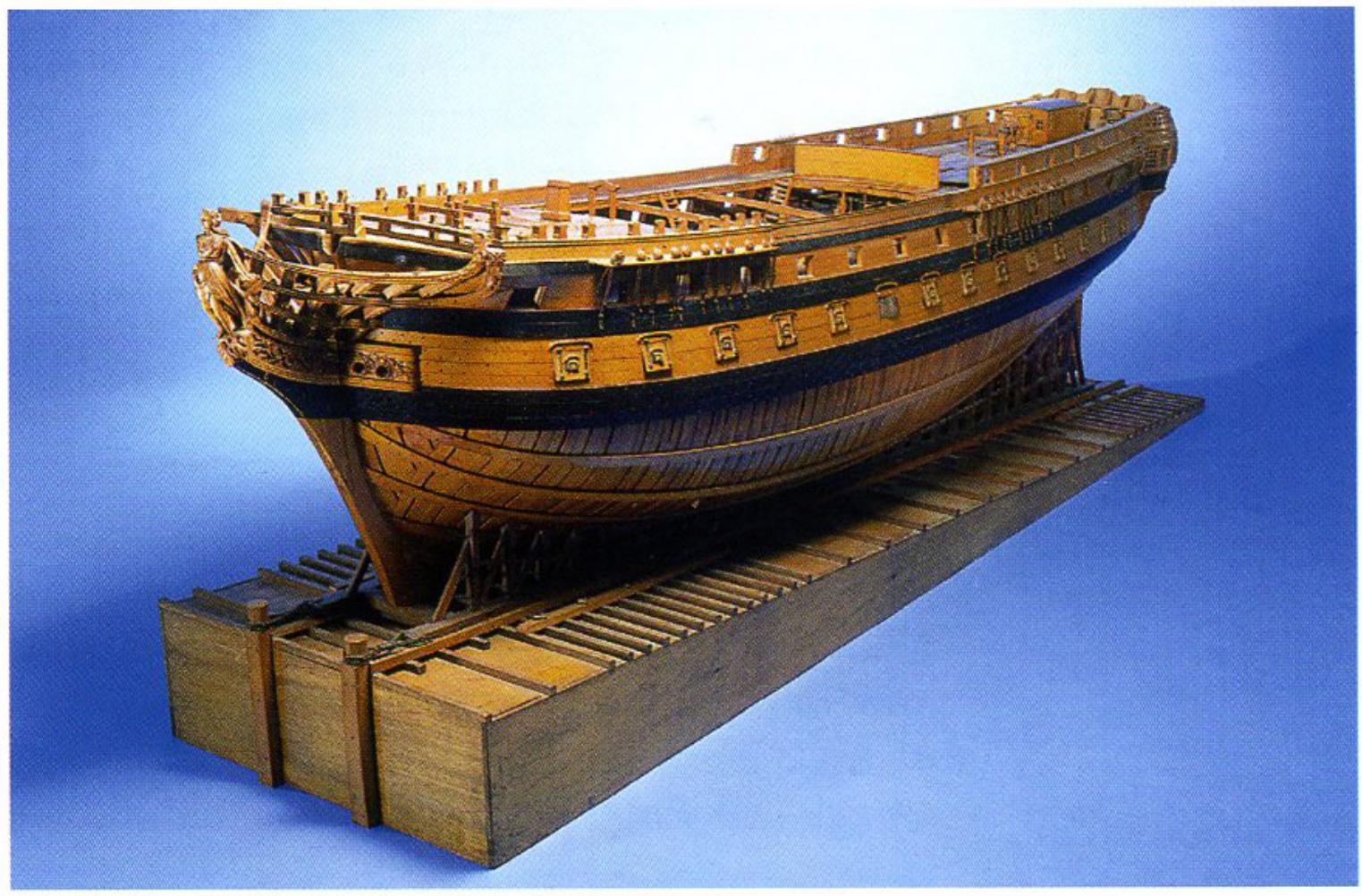
gifts, such as the silver model presented by Andries Frisius to the son of the Japanese shogun in 1630 together with navigation instruments and a telescope. Nowadays most models are made as pastimes. In the past building ship models for fun was a luxury few could afford. Before the 20th century there was no such thing as 'leisure activities' or 'hobbies'. And that is a pity, for few things are as instructive as a ship model from a historical period, made by someone who knew what he was doing. Apart from its aesthetic qualities, a model of this kind is an important historical source and its technical details reveal the state of technology at the time.

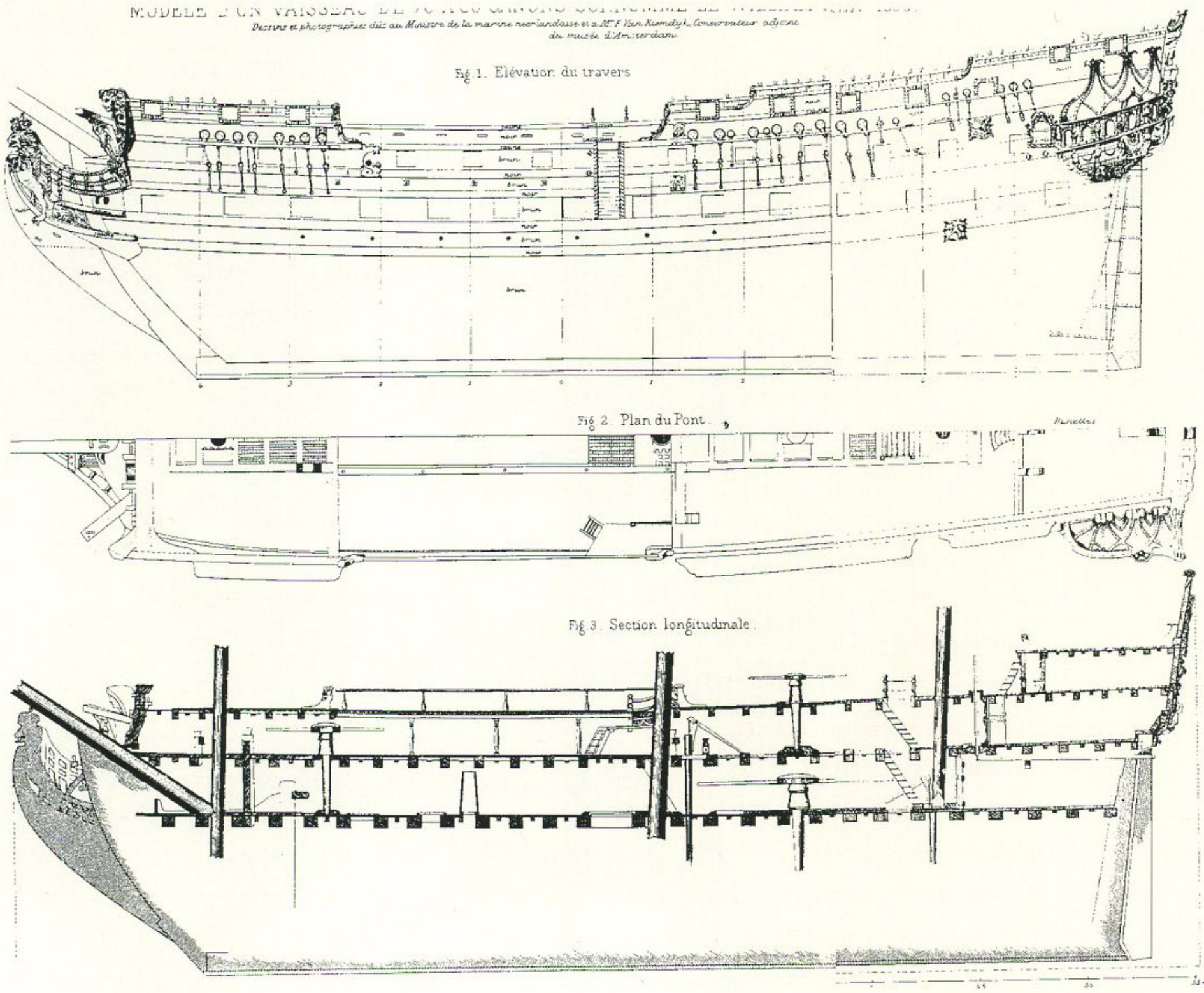
Model to ship

In the 17th century Dutch ship models played an almost exclusively decorative role. The idea that a model served as a guide for a shipwright in building a ship is a myth. While the custom of making models and maquettes prior to the construction of buildings and ships is an old one, they were always intended for the use of the customer, who wanted a three-dimensional representation of the object commissioned. No shipwright has ever built a ship according to a model, just as no contractor has ever put up a building according to a model. To this day in both cases the basis for a project is always the specifications, a written description of the structure and all its components, accompanied ideally by a series of drawings. In the 17th century drawings for ships were not made. The tentative use of them did not begin until the 18th century. But a model, even one the size of the *William Rex*, could never have served as the point of departure for a real ship (figs. 26, 27). Neither the construction method nor the professional pride of the builder permitted that.

24
Model of the 19th-century frigate *Eurydice*, which was used to train cadets in the working of the rigging.

25
French model of a ship in a so-called 'berceau' (cradle). This construction protected the ship from the extreme forces that acted on it during its launch. J.P. Asmus, the superintendent of the State Shipyard in Amsterdam, brought the model back from a 'study trip' to France in 1797 with a view to introducing the device in the Netherlands. The idea was rejected.

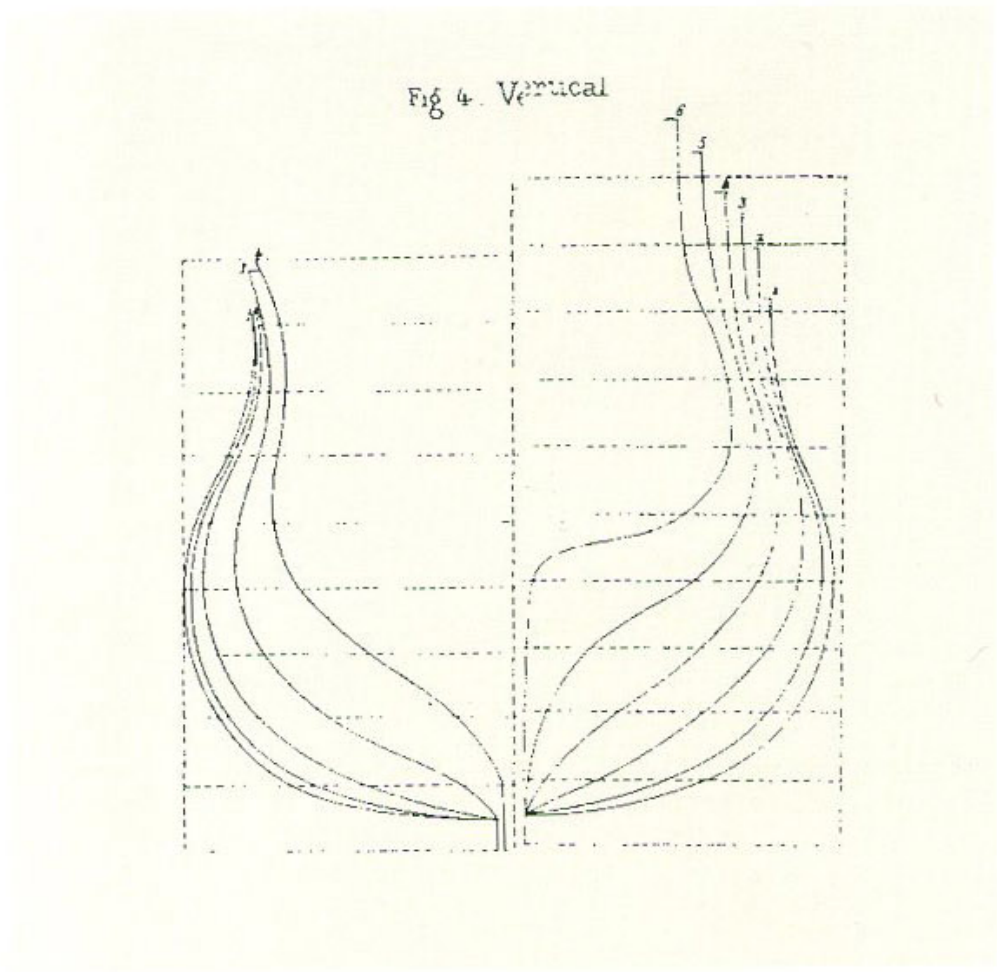




26
The *William Rex* was featured in detail in the renowned, late 19th-century work by Admiral Pâris, *Souvenirs de Marine*. Pâris was supplied with information by the then curator of the Rijksmuseum, F. van Riemsdijk. Here we see a side elevation of the *William Rex*.

Iron discipline

Standing before the *William Rex*, one is struck by the complexity and height of the rigging. A sailing ship was a machine propelled by the wind and steered by muscle power. The muscle was provided by the sailors, who executed the endlessly practised orders precisely and without hesitation. The captain laid down the course and decided on the number of sails to be set or taken in, the officers translated his decisions into orders, and the bosun conveyed the message to the crew, who climbed into the rigging in complete confidence that the orders



27
Also from *Souvenirs de Marine*: a longitudinal section of the *William Rex*.

given would lead to the preservation of the ship and its company. This required tight organisation. The crew of a sailing ship was divided into as many watches (so-called quarters) as the ship had masts and everyone knew exactly where his place was when the orders were given. Seamanship was a craft you had to learn. It required experience, strength, stamina, daring and unconditional subordination to the officers in command. This blind obedience may certainly be compared with military discipline. The authority exercised by the captain of a ship was all but God-like. Next to God, the master held the fate of the ship in the palm of his hand and the crew were expected to follow him to the ends of the earth. This demanded iron discipline. Although wages were low and the food often literally hard to stomach, especially on warships, the crew were required to give their utmost. Anyone who was not sufficiently cooperative could expect fines deducted from his wages, flogging (the cat o' nine tails), confinement in chains or even death. This last took gruesome forms: hanging, keel-hauling or simply being thrown overboard ('walking the plank'). No wonder that mutiny was rare and disobedience virtually unknown. When the bosun blew his whistle, the seamen reacted as was expected of them. Everyone's life depended on closely following orders.

Seamanship

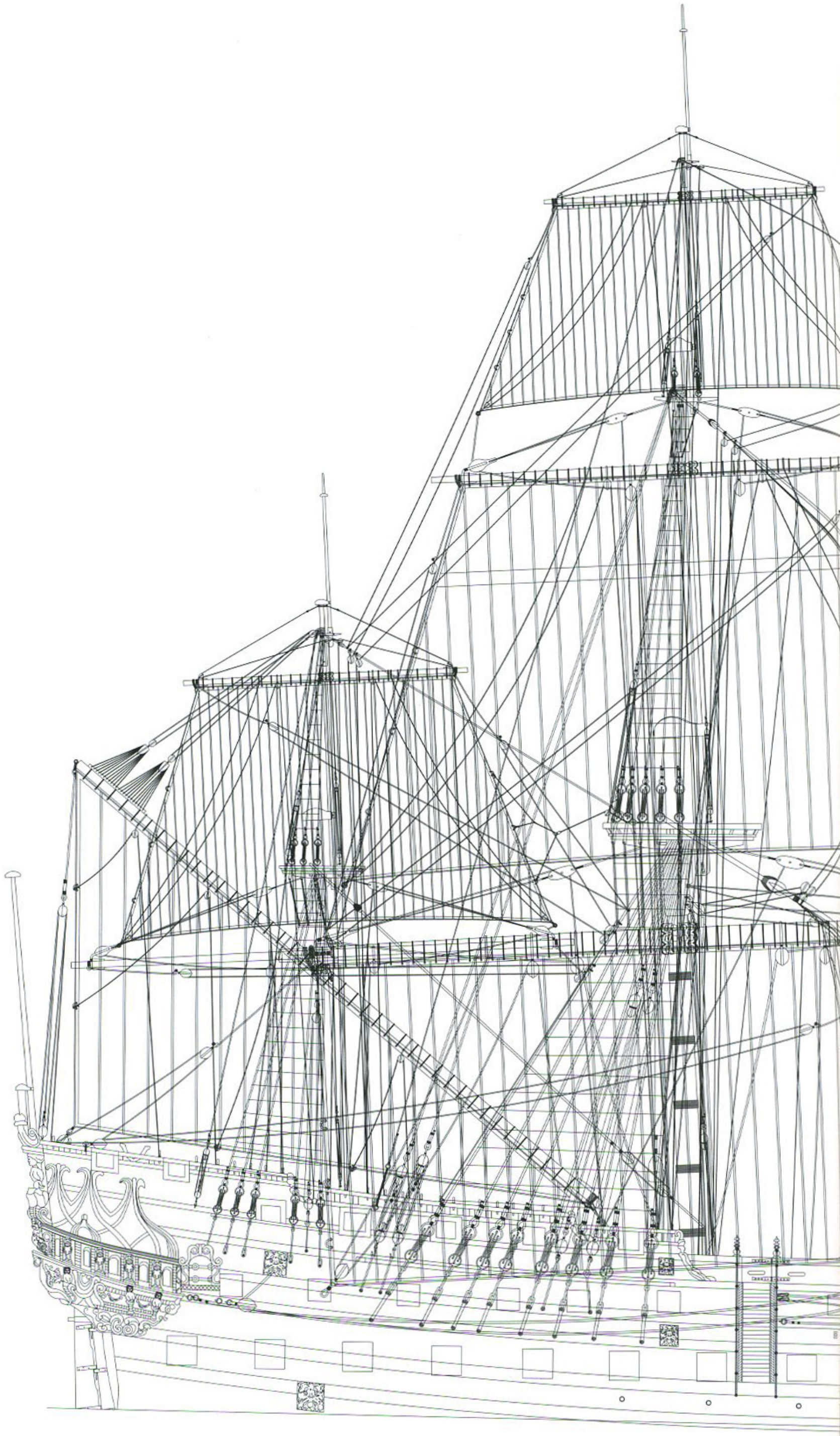
The 17th-century ship was propelled by the wind. To this end, it was equipped with masts on which sails hung. From fore to aft these were the bowsprit, the fore mast, the main mast and the mizzen mast. On large ships masts were very high: 50 metres was not exceptional. The tall trees from which such masts were made were scarce and so a mast was composed of several parts. The lower mast was extended upwards by the topmast and then the topgallant mast. Above that there was usually a flagstaff. Masts and topmasts had one sail each. The foremast and the main mast carried the foresail and the main sail, the fore topmast and the main topmast carried the fore topsail and the main topsail, and the topgallant masts carried the fore topgallant sail and the main topgallant sail (fig. 28). The mizzen mast was slightly different: on the lower mast it carried the triangular mizzen, a sail that was hung alongship (lengthwise) and was mainly used to help balance the ship so that it would stay on

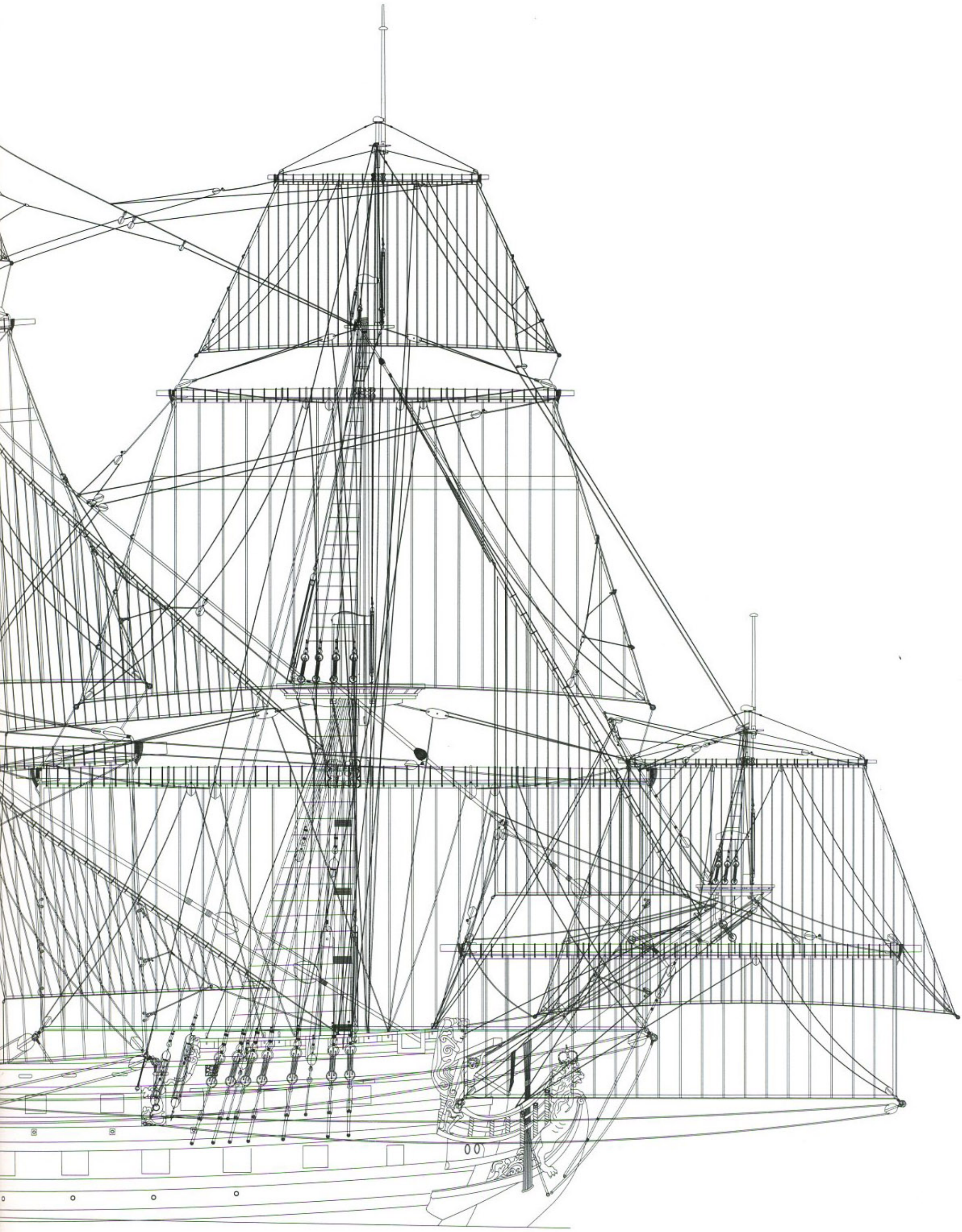
29
The bowsprit of the *William Rex* with the furled spritsail and the spritsail topsail on the spritsail topmast. To the right the fore topmast staysail and on the far right the fore sail and the fore topsail.

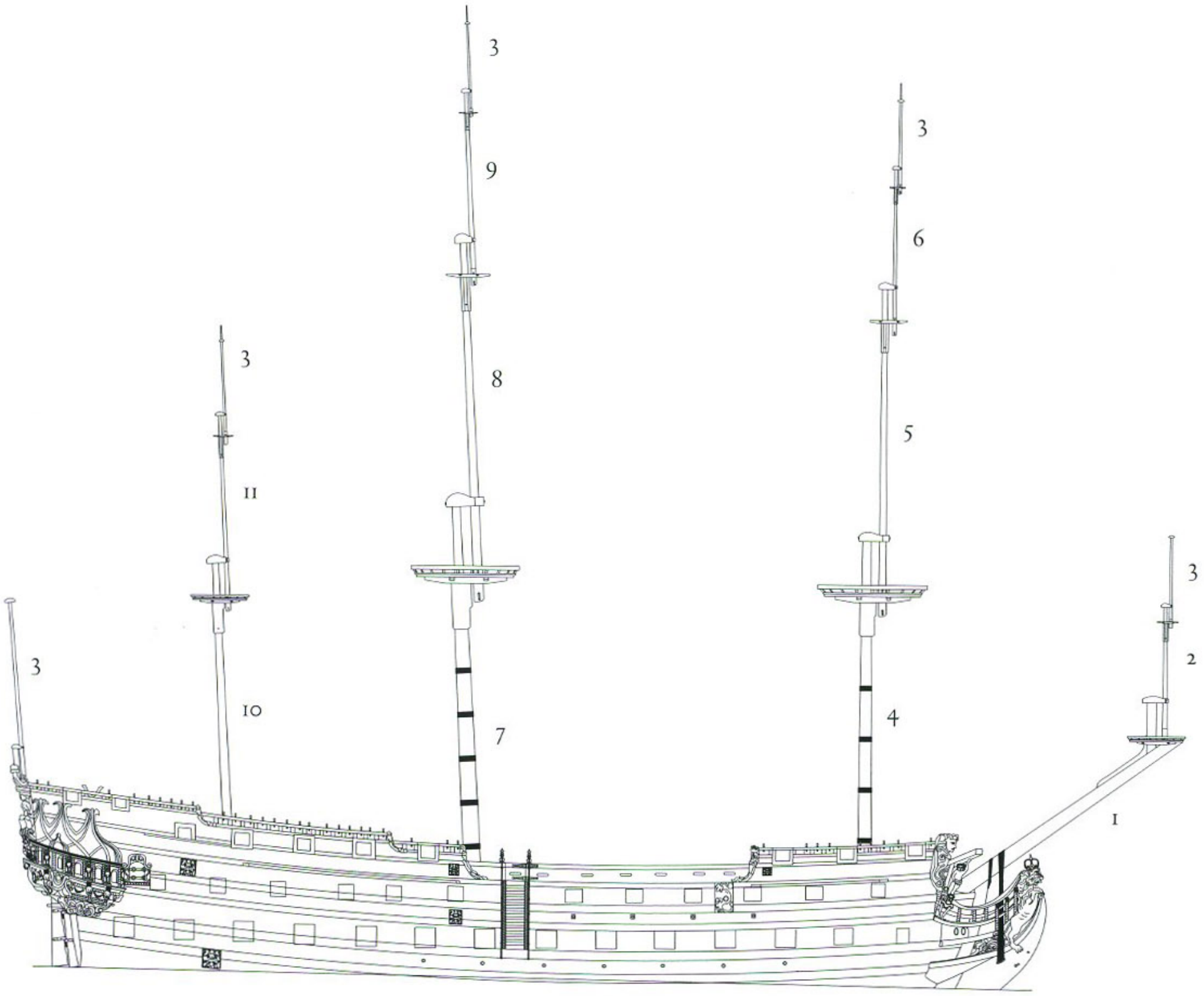
< 28
Detail of the main mast of the *William Rex*. The main sail on the lowest yard is furled, the topsail and the topgallant sail above it are set. The platform behind the topsail was known as the 'masttop' and in battle was used by sharpshooters trying to pick off enemy officers.

course without the need for pressure from the rudder. On the mizzen topmast hung the mizzen topsail, the bottom of which was held out by the thin crossjack yard.
Lastly, the bowsprit carried the sprit sail and the sprit sail topsail characteristic of the 17th century on the upright topmast at the end of the bowsprit (fig. 29).
At the time of the *William Rex* more fore-and-aft sails were gradually beginning to be used, because they could enable the ship to sail closer to the wind, thus more in the direction from which the wind was blowing. They were usually carried on the stays, which were part of the standing rigging that supported the masts so that they did not break in strong winds. The sails were named after the stay on which they were hoisted: fore topmast stay sail, main topmast stay sail and main stay sail. Another important part of the standing rigging was the shrouds, between which ratlines were tied which the crew used like rope ladders to climb up the mast.
The running rigging, finally, was used to move the sails so that they made optimal use of the wind: the braces turned the sails into the wind, the sheets drew the bottom of the sails taut, the bowlines hauled the weather-side of the sail in to prevent the wind suddenly blowing into it from the front, and the clews and buntlines were used to take in sail if the wind was blowing too hard or if the voyage was over.
All in all, a complex but logical and efficient system that worked like a smooth-running machine. There was not a line too many on a ship; everything had a function and everything worked, because it had been tested for generations, over centuries of seamanship (fig. 30).

30
Drawing of the rigging of the *William Rex*. For the various parts see pp. 34-38.

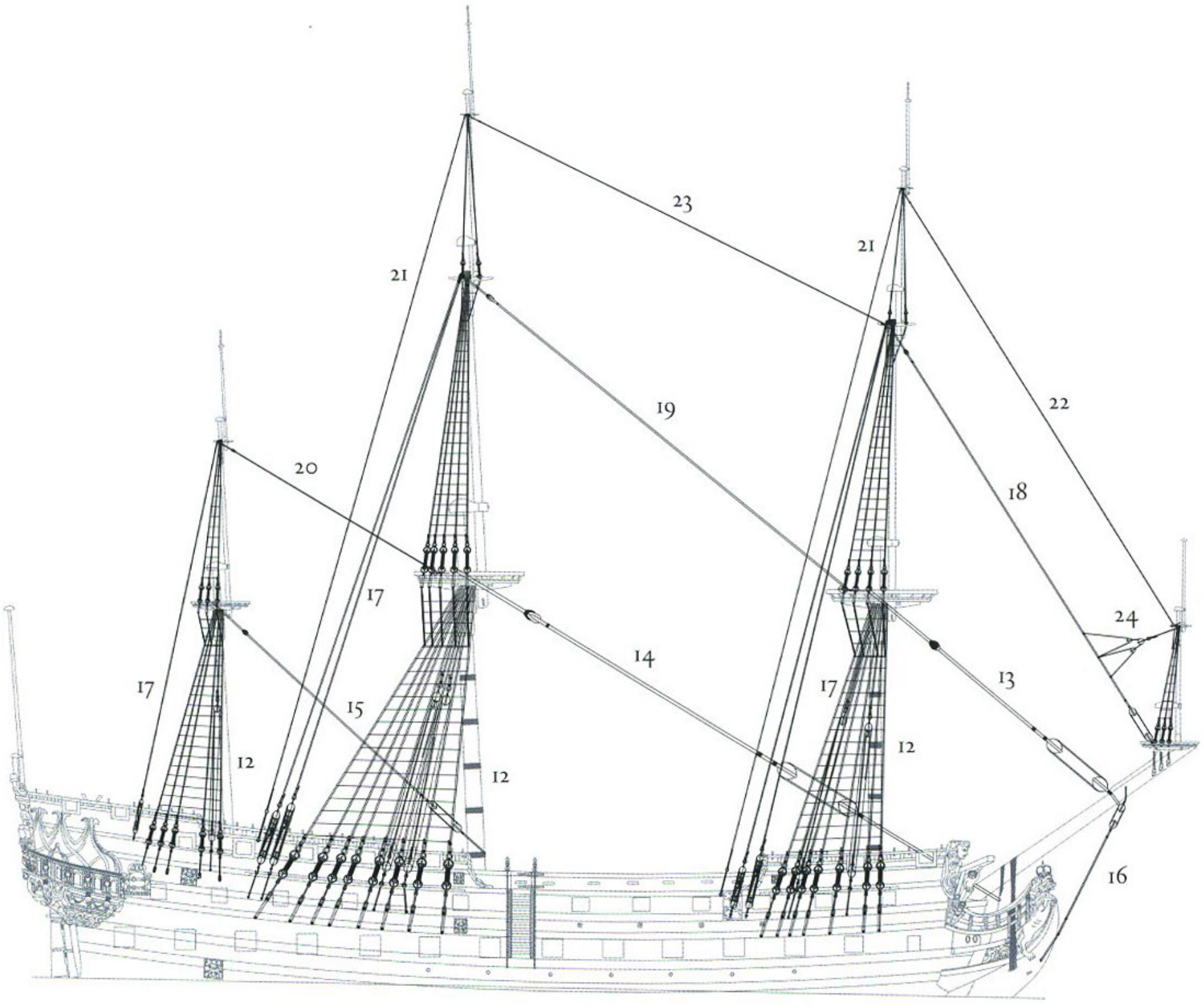






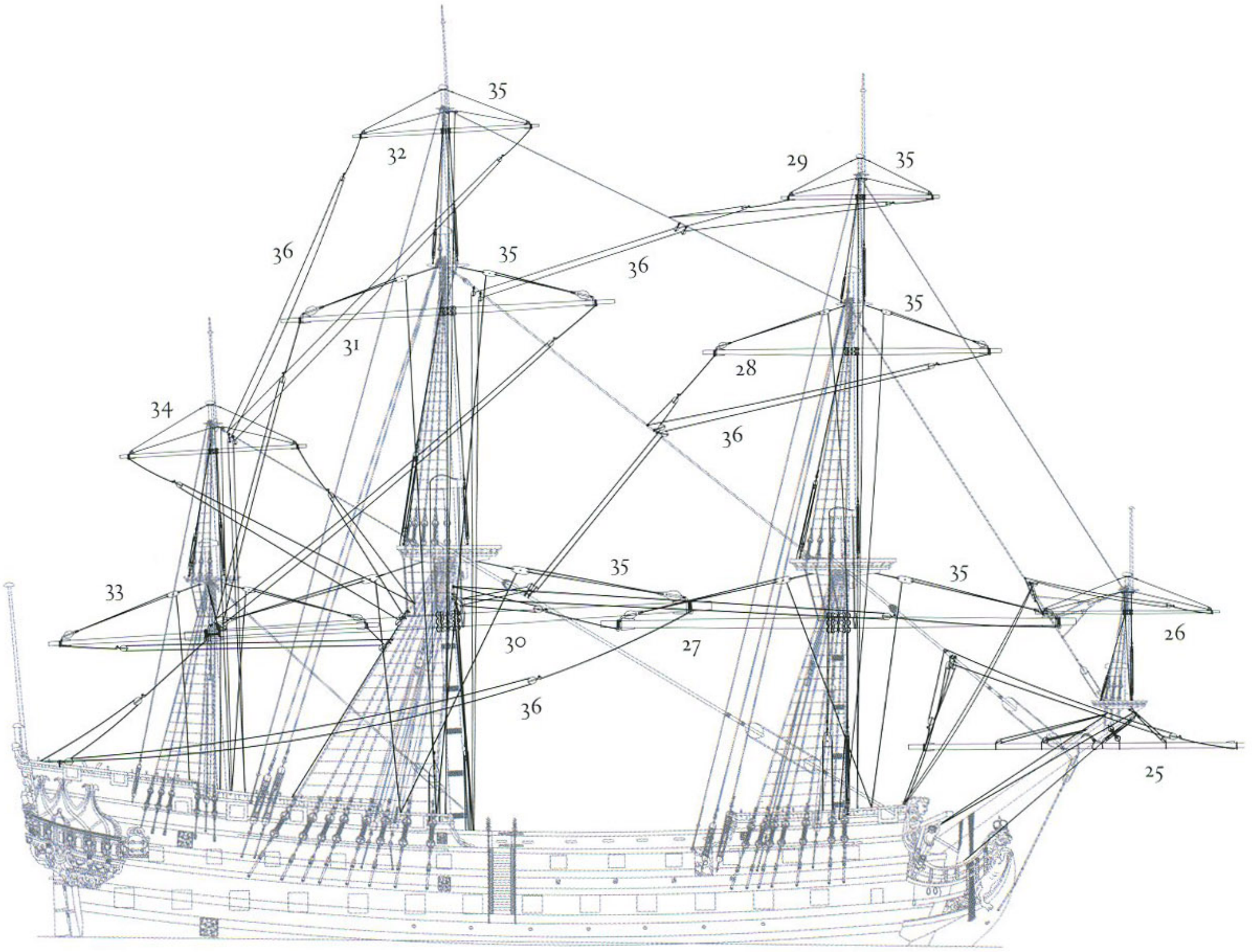
Masts

Bowsprit (1), spritsail topmast (2) and flagstaff (3). Fore mast (4), fore topmast (5), fore topgallant mast (6) and flagstaff (3). Main mast (7), main topmast (8), main topgallant mast (9) and flagstaff (3). Mizzen mast (10), mizzen topmast (11) and flagstaff (3).



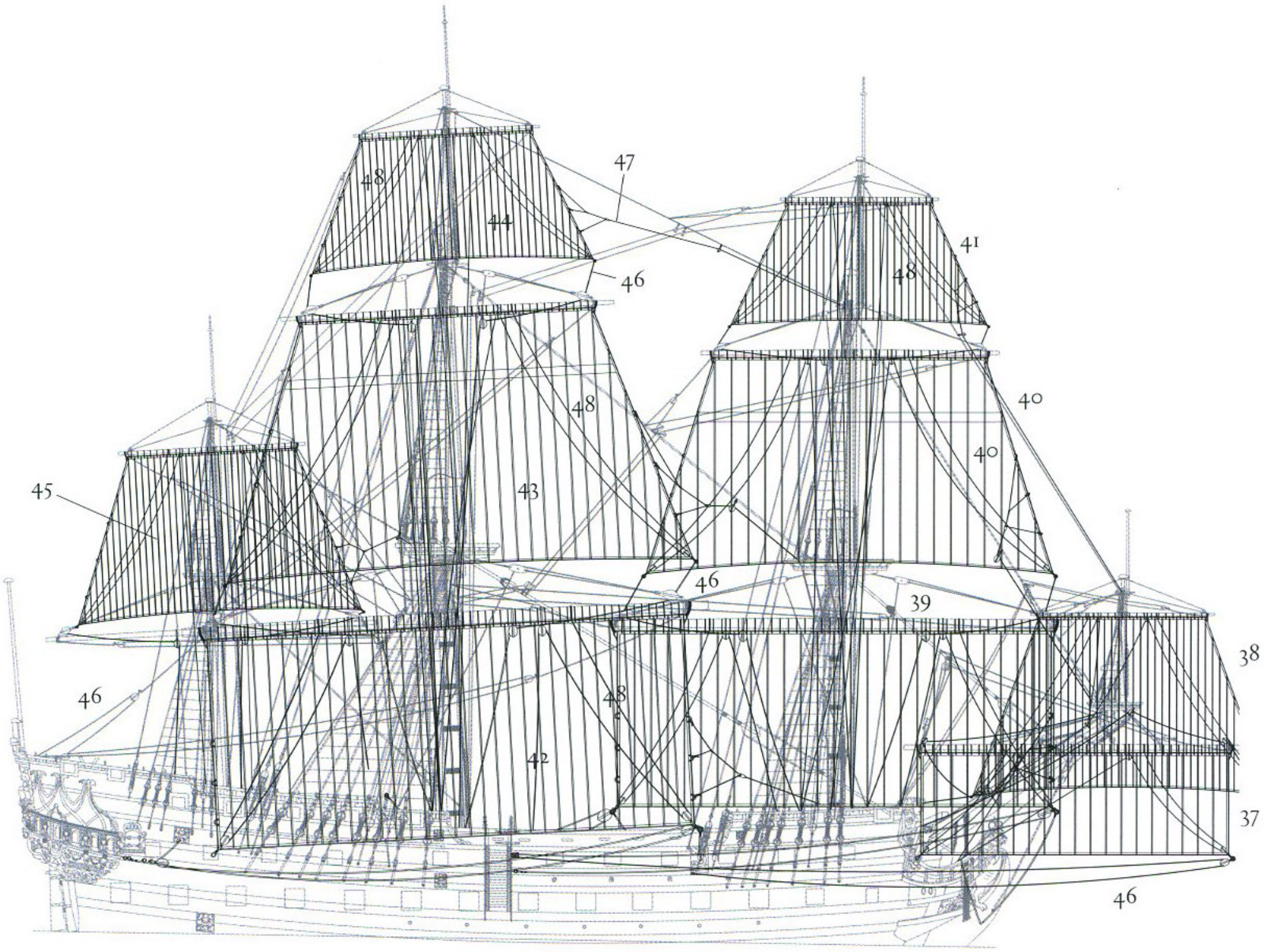
The standing rigging

The masts are supported from the back by shrouds (12) and from the front by stays: the fore stay (13), main stay (14) and mizzen stay (15). The bowsprit is supported from below by the bobstay (16). The topmasts are supported from the back by backstays (17) and from the front by the fore topmast stay (18), the main topmast stay (19) and the mizzen stay (20). The two topgallant masts are also supported from the back by backstays (21) and from the front by the fore topgallant stay and the main topgallant stay (23). A backstay (24) runs from the spritsail topmast aft to the fore topmast stay.

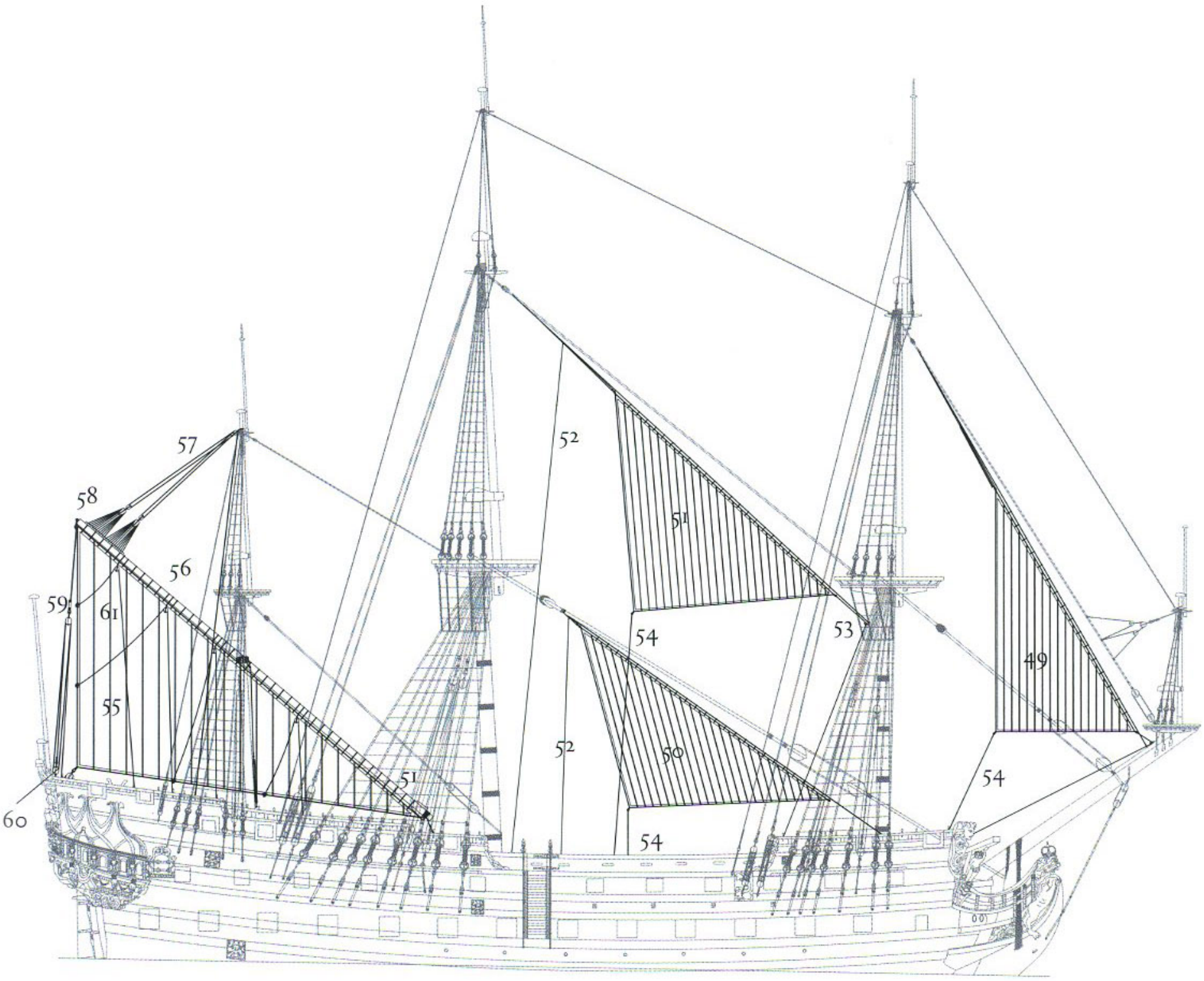


The yards and rigging

On the bowsprit the spritsail yard (25) and on the spritsail topmast the spritsail topsail yard (26). On the fore mast the fore yard (27), on the fore topmast the fore topsail yard (28) and on the fore topgallant mast the fore topgallant yard (29). On the main mast the main yard (30), on the main topmast the main topmast yard (31) and on the main topgallant mast the main topgallant yard (32). On the mizzen mast the lateen yard (56) and the crossjack yard (33), on the mizzen topmast the mizzen yard (34). The yards are hung from the halyard and each have several lifts (35) and a few braces (36).



The athwartship sails and rigging
On the bowsprit the spritsail (37) and the spritsail topsail (38). On the fore mast the fore sail (39), the fore topsail (40) and the fore topgallant sail (41); on the main mast the main sail (42), the main topsail (43) and the main topgallant sail (44). On the mizzen topmast the mizzen topsail (45). The lower corners of the athwartships sails are pulled downwards by the sheets (46). The bowlines (47) are attached to the sides. Sail could be taken in by using the clews (48) hanging from the back of the sail and buntlines, not visible here, on the front.



The fore-and-aft sails and rigging

The fore-and-aft sails are known as the fore topmast staysail (49), the main staysail (50) and the main topmast staysail (51). They are hoisted with the halyard (52) and lowered with the downhauler (53). The sheet (54) is used to tauten the sail. The mizzen (55) is also a fore-and-aft sail, although it is attached not to a stay but to the lateen yard (56). The top end is held in the direction of the mast by the boom topping lift (57), and at the bottom by two tackles known as 'piss pots' (58). Also attached to the top end are two vangs (59), which brace the yard downwards and sideways. The sheet (60) tautens the sail and the clews (61) are used to furl it.

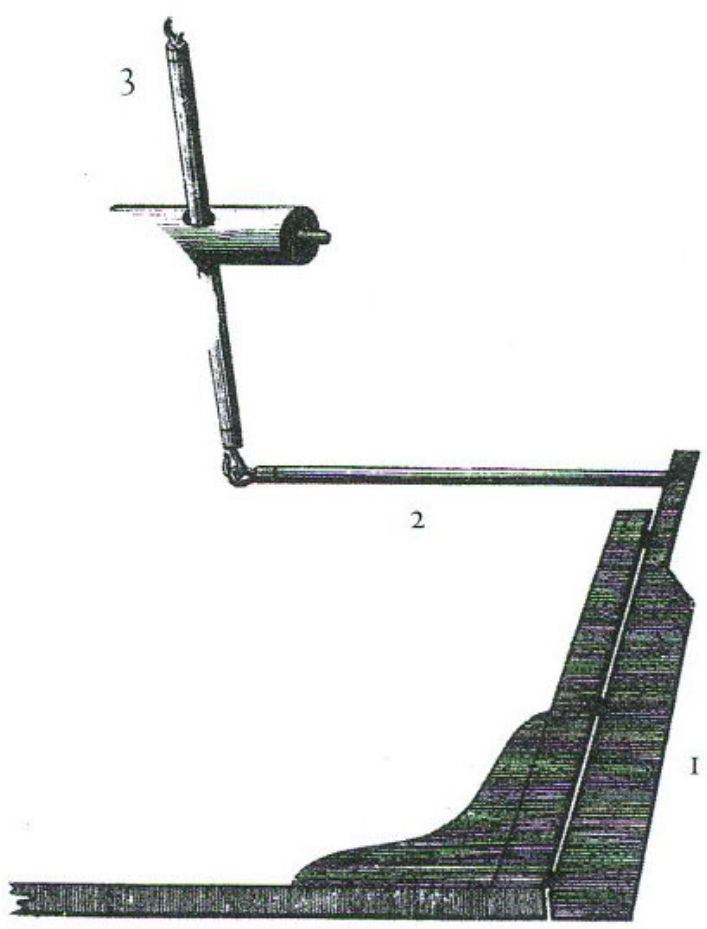
Rudder and anchor

The sails of a 17th-century ship not only propelled it but also steered it. Seamen could brace the sails (turn them to the wind) so that the ship automatically followed the right course. When turning, special steering sails were used, such as the sprit sails fore and the mizzen aft. The noticeably small rudder was only an aid with which to make small adjustments.

The rudder was fixed to the back of the stern with pintles and gudgeons so that it pivoted. From its top the helm or tiller extended into the ship. In the gun room the tiller rested on the sweep, on which it could move back and forth. Attached to the front of the tiller was the upright whip-staff, which could move in a rotating chock in the deck above (fig. 31). There stood the helmsman, who could move the rudder by means of the leverage. Because the whip-staff lay loose in the turning chock, it could be pushed far in if a greater deflection of the rudder was required. For this reason the whip-staff was so long that if the course was straight the end often protruded through a slot in the deck above (fig. 32). In the *William Rex* we indeed see just such a slot, covered in this case by a hatch with a hole which anchors the whip-staff firmly and prevents it breaking off. In fact no use was made of these hatches. This is one of the few points on which the model is at odds with reality.

The pressure exerted on the rudder by the water was enormous. Sometimes the whip-staff had to be operated by more than one man, or tackles had to be fixed to the tiller to keep the rudder under control. Steering by the whip-staff had a number of disadvantages, the principal one being that the helmsman could not see where he was going. He stood on the lower deck and so had no view of the sea in front of him. He obeyed the orders of the officers walking on the deck over his head and used a compass to keep to the course given to him. The compass was mounted in gimbals that ensured that it always remained horizontal. It hung in the binnacle, a housing in front of the steering position in which there were also several lanterns so that the helmsman could read the compass even at night.

When a ship was not sailing it lay at anchor. In the 17th century it seldom happened that a ship was moored to a quay in the way that we are familiar with today. A ship normally anchored in a harbour in relatively deep water



31
Diagram of the working of the rudder (1), with tiller (2) and whip-staff (3).

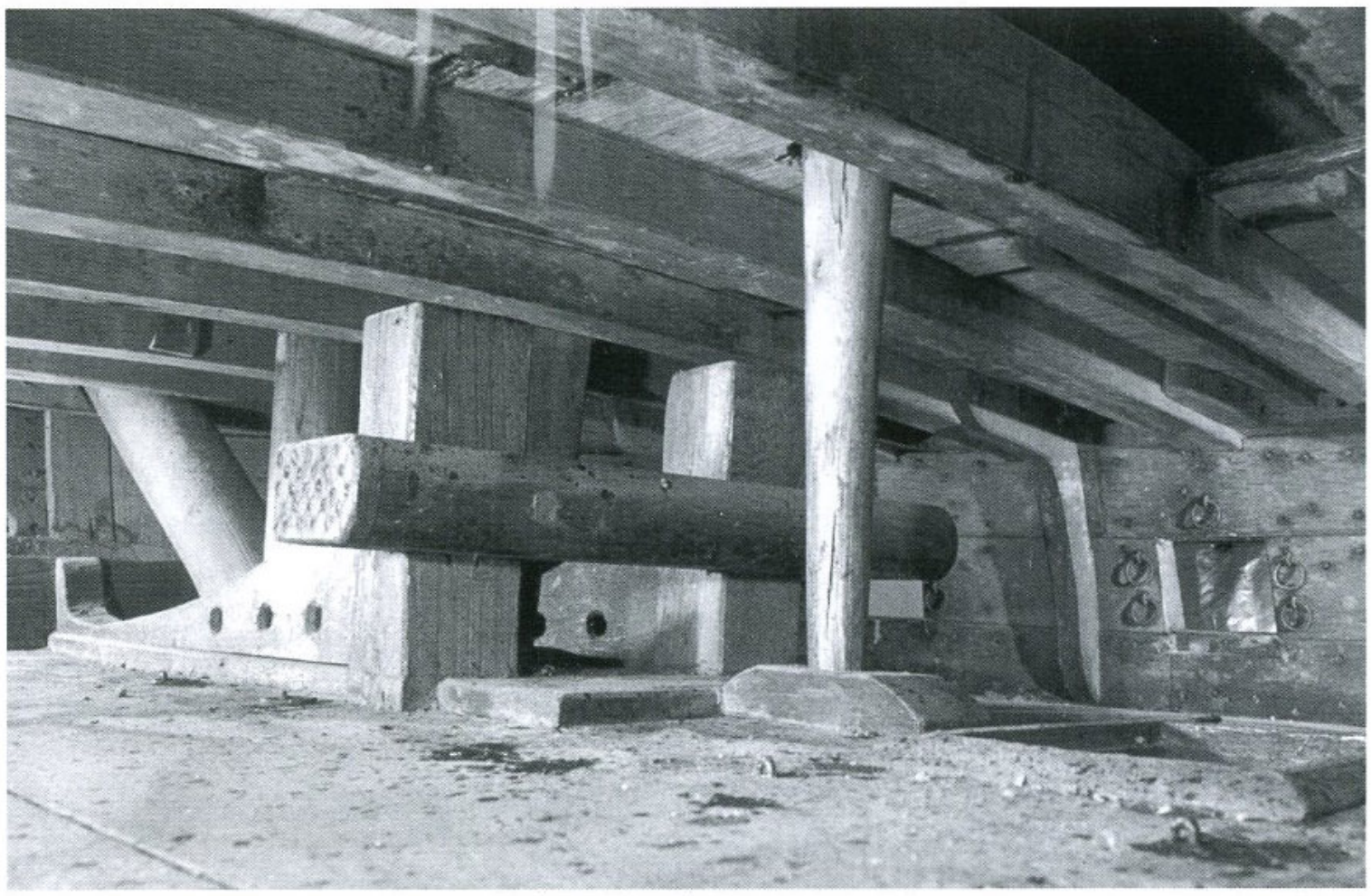
and slowly turned behind its anchor with the movement of the tide, often turning 360 degrees to go 'round the clock'. The only link to the shore was provided by sloops and boats, lighters and other vessels. So each ship had at least one sloop (for transporting people) and one boat (for loading or unloading goods) which were either carried on deck or made their own way independently (using sails). They could also be towed.

In principle an anchor was a hook that dug into the sea bottom and thus kept the ship more or less in its place. It was made of wrought iron and had to meet strict standards. To test a newly made anchor, it was first dropped on to an old cannon. If the anchor was cracked or bent by the impact, it was rejected. This test was a necessary precaution, because in an emergency the survival of the ship and its crew might depend on the quality of the anchor.

The anchor's weight depended on the size of the ship. Small ships and sloops often had only a four-armed grapnel,

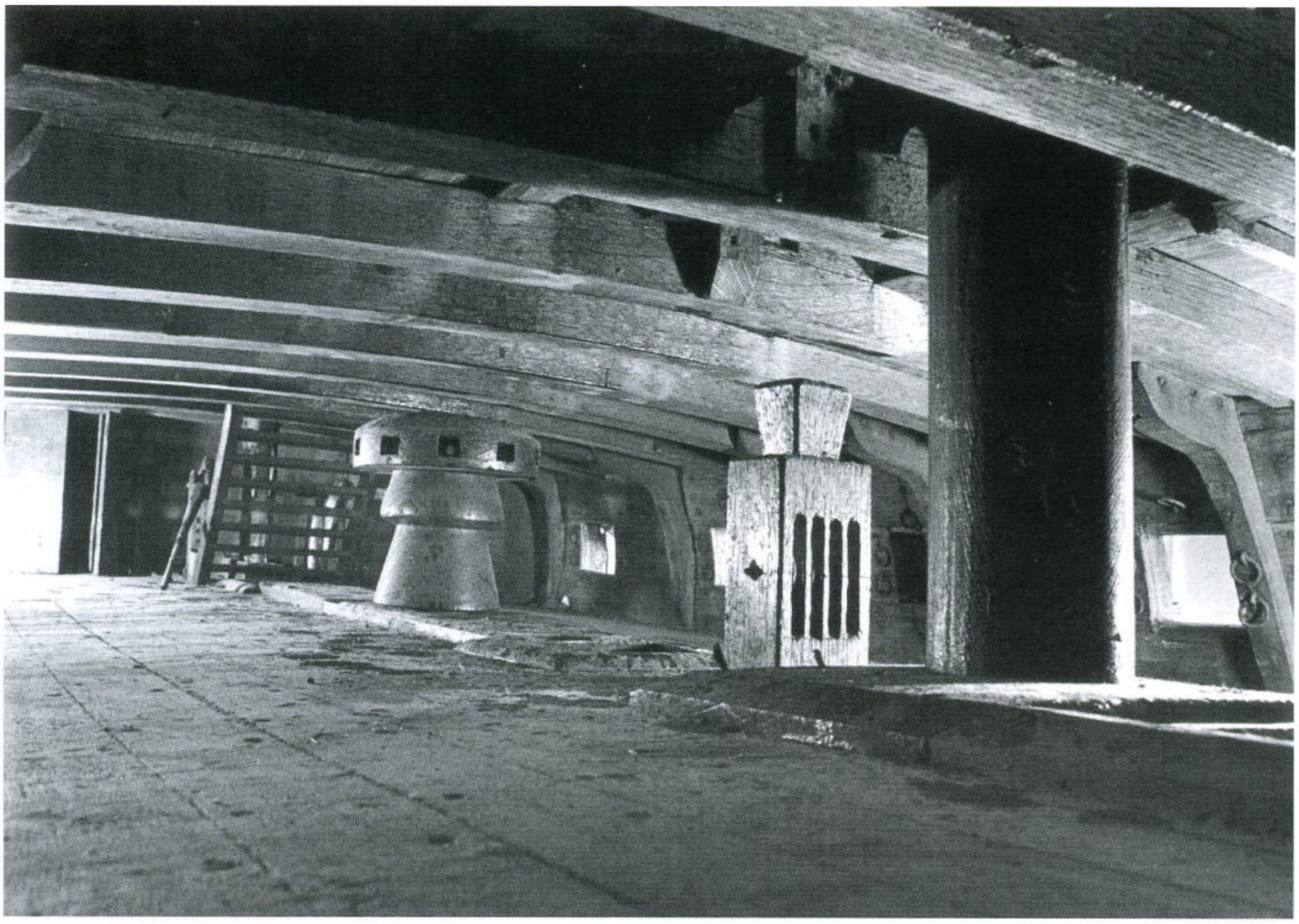
32
View of the afterdeck, where the whip-staff is seen to protrude above the deck. The helmsman stood below.

33
View forwards along the gun deck of the *William Rex* with the bitt, on which the anchor cable was belayed.



which could be thrown out and hauled in by hand. The bigger the ship, the bigger the anchor. That could mount up: for a ship of 65 feet (18 metres) the anchor was reckoned to be about 300 kilos. For a ship of the rate to which the *William Rex* belonged, it meant that the largest anchor, measuring slightly under 4.5 metres, weighed just over 1700 kilos. A seagoing ship normally carried four anchors: an everyday anchor, a sheet anchor for use during bad weather, a small bower for when the everyday anchor was not enough, and a light kedge, with which the ship could be hauled along when there was no wind. Several spare anchors were also often stored in the hold.

The anchor rope or hawser was made fast (belayed) to a heavy wooden construction in the forward part of the ship, the bitt (fig. 33). Once the anchor had been dropped, the hawser was made fast to the bitt. An anchor cable was 170 to 200 metres long and weighed over 4 ton (and much more when wet). If less than the whole length was used, the remainder stayed in the cable-tier, the storage space for the anchor rope in the lower forepart of the ship. There were usually four or more ropes in there. Throwing out the anchor was a task to be done with some caution, and raising it was an operation that took at least an hour and for which heavy equipment, the capstan, was used (fig. 34). The anchor cable, which for a ship like the *William Rex* was 22 cm in diameter, was too thick to be wound round the capstan. For this reason a so-called messenger was used, a rope that ran from the bow of the ship to the capstan, was wound



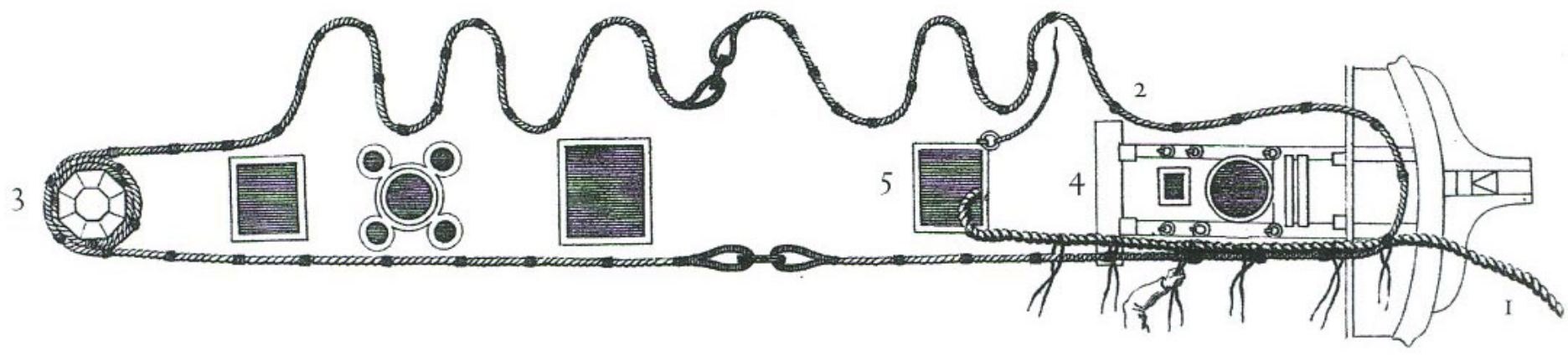
34
View of the gun deck of the *William Rex* with the capstan, with which the anchor was raised.

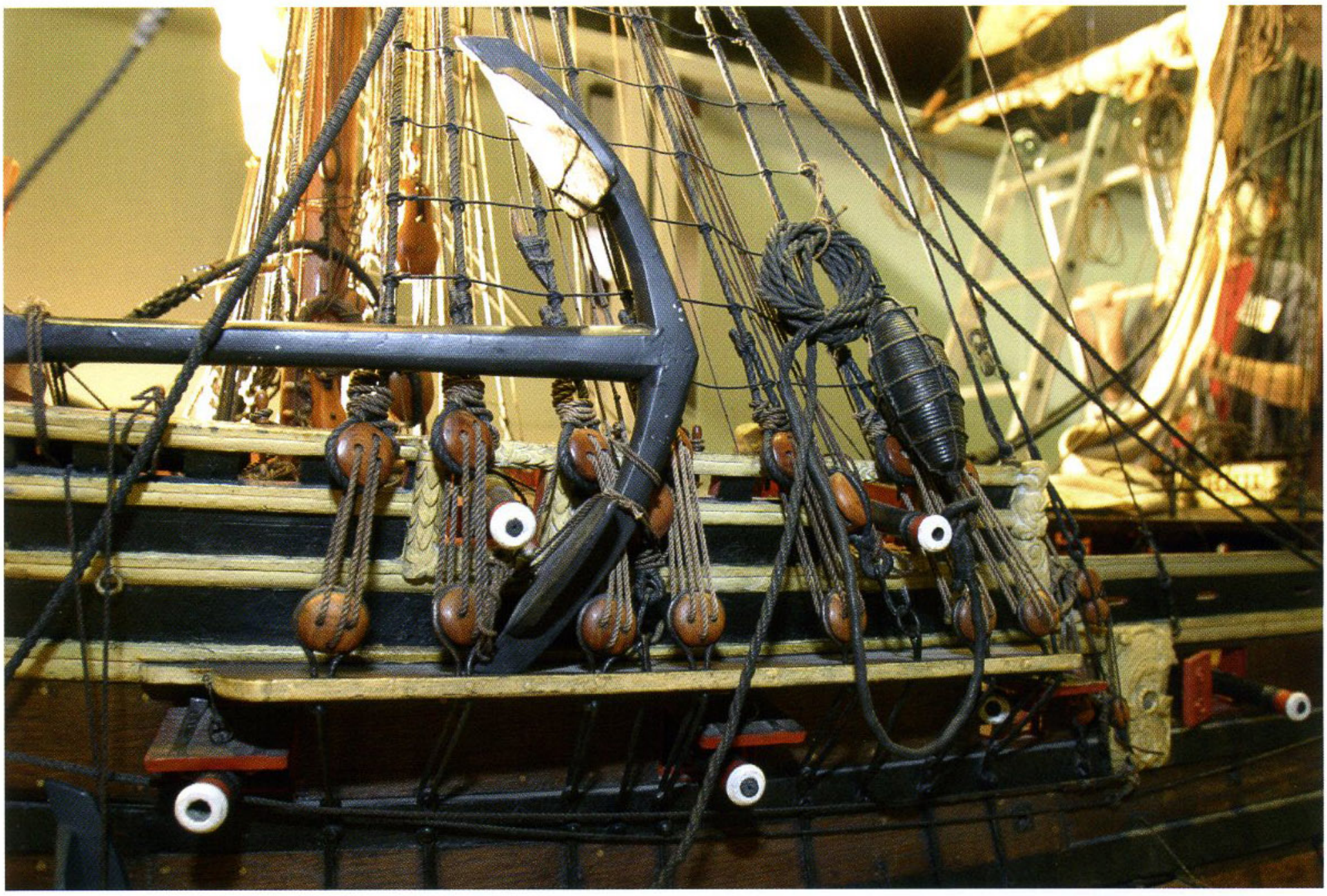
round it a couple of times and then led back to the bow, where the ends were tied together (fig. 35). The anchor cable was tied to the messenger at various points with seizings; the messenger was moved by the turning of the capstan like a sort of bicycle chain. In this way the hawser slowly came into

the ship, with the seizings furthest aft being untied at the place where it disappeared into the hold, while forward near the hawse hole new ones were tied on.

When the anchor came out of the water, it had to be lashed to the side of the ship, which might easily be

35
The use of the messenger, which was wound round the capstan instead of the heavy anchor cable. Here the deck is seen from above.
1 anchor cable
2 messenger
3 capstan
4 bitt
5 cable-tier





36
The anchor was firmly secured to the side of the ship. The anchor buoy hangs in the rigging.

damaged by this large swinging, sharply pointed object if there was the least swell. To prevent this, on each side of the ship there was a cathead from which hung a cat tackle with a hook that was inserted into the anchor ring. With the help of another tackle fixed to the fish david, a separate beam on the forecastle specially intended for this, the anchor was lifted into the right position and tied down.

All this was a time-consuming business. If the ship had to sail quickly, to escape from an enemy or a sudden storm for example, the captain might be forced to have the cable cut, thus losing the anchor. This was a great loss and it was not uncommon for attempts to be made to recover it later. For this reason the anchor always had a buoy, so that the right spot could be found. On the *William Rex* such a buoy can be seen tied up in the fore shrouds (fig. 36).

THE SHIP AS A FIGHTING MACHINE

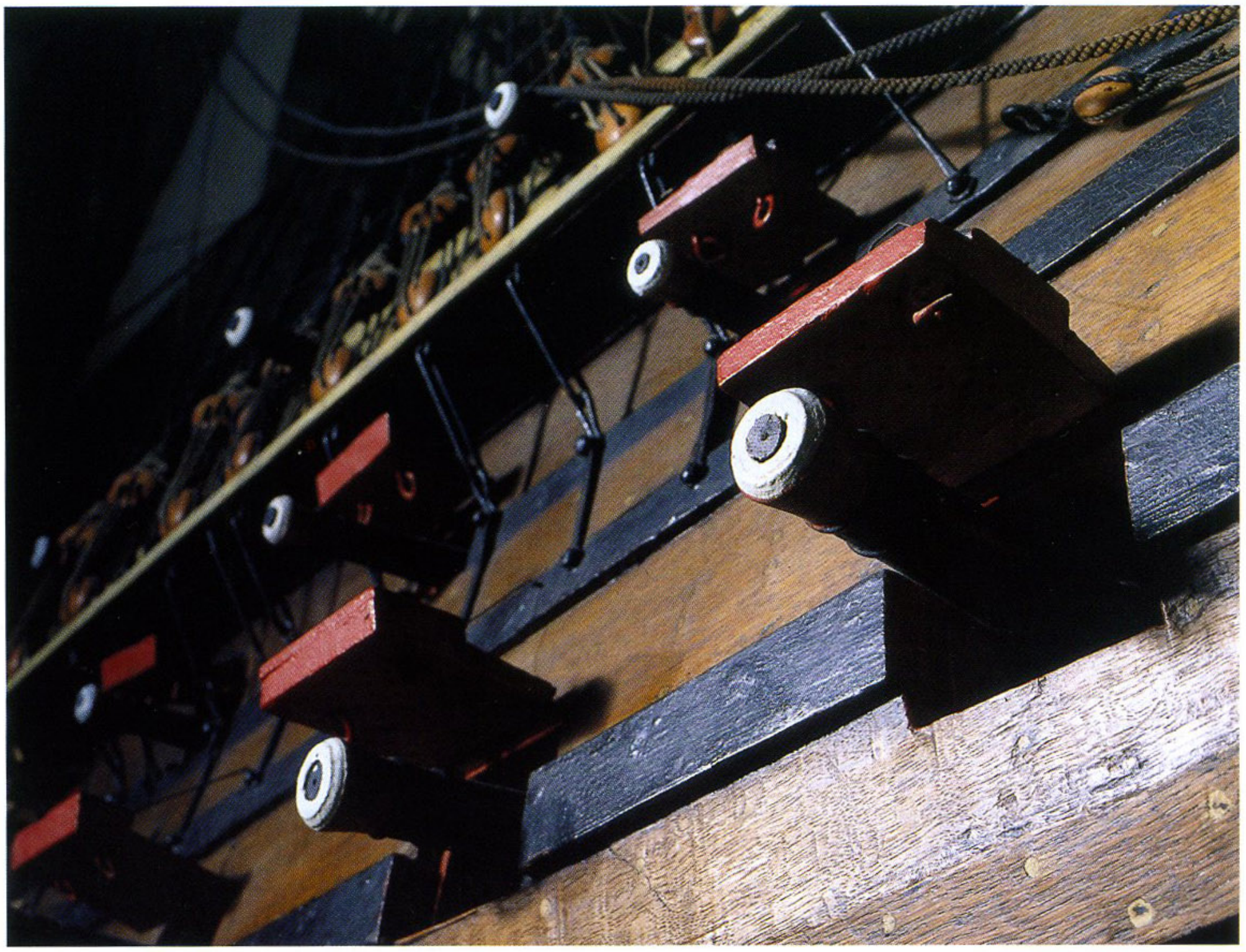
Waging war

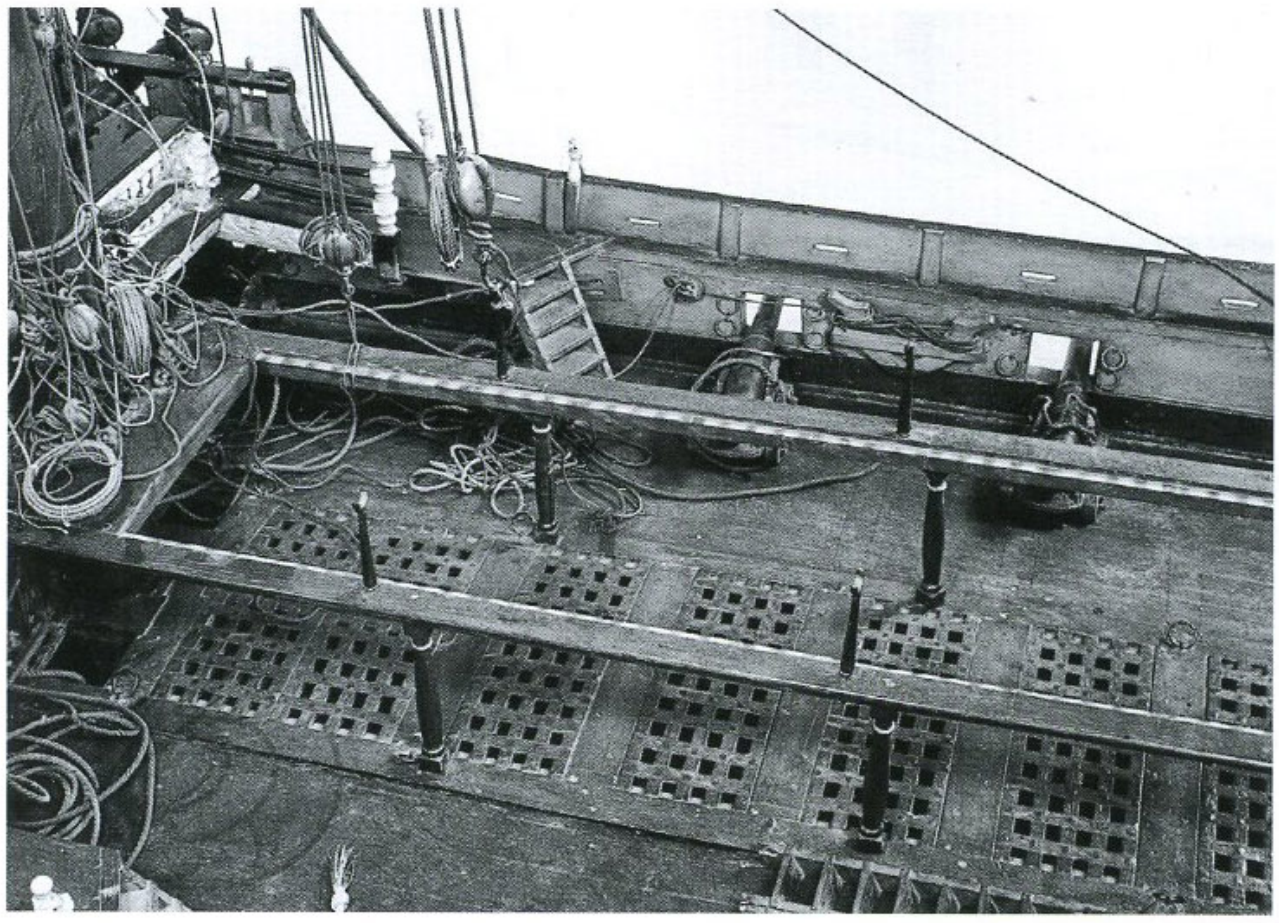
At the beginning of the 17th century a ship was still a 'multi-purpose' tool with which, besides making voyages of discovery and conducting trade, you could defend yourself if need be,

but by the end of the century a warship like the *William Rex* had evolved into a formidable fighting machine whose appearance alone, it was hoped, would be enough to dishearten the enemy and make him abandon his evil plans. The *William Rex* indeed has an impressive line of cannons (fig. 37).

In battle the crew's roles were different from normal. The watch on duty stayed at the ready as far as possible to operate the sails and manoeuvre the ship. Carpenters and sailmakers were on stand by in the hold with wooden plugs and canvas to limit the damage if the ship was hit under water. The pumps were manned as a precaution and the master gunner quickly filled his last cartridges with powder. In the masttops the sharpshooters loaded the muskets and rifles that would be aimed at the officers on the quarter deck of the enemy ship, and in the hold the surgeon sharpened his scalpels and laid ready his amputation saw. The rest of the crew took up their positions at the cannon. Each piece had its own crew, consisting of up to eight men (fig. 38). It is hard for us to imagine the condi-

37
The cannons of the *William Rex*.





38
The top gun deck of the *William Rex*. This photo was taken during the restoration carried out in the late 1960s. Part of the gangplank has been removed.

tions in which the gun crews did their work. The cannon had to be hauled inside with the aid of tackles, and then a cartridge, a linen or paper bag containing a measured amount of gunpowder, was put in through the muzzle. It was rammed down three times, and then the cannonball was inserted. A plug made of short lengths of rope tied together was used to ensure that the ball did not roll out again prematurely through the movement of the ship. The cartridge was punctured by pushing an awl through the cannon's vent hole, which then had fine powder strewn in and around it. After the hole and the powder had been covered by a lead flap, the gun was again hauled with tackles so that its muzzle was outside the ship. It was aimed with the aid of crowbars. Then the lead flap was removed and the crew waited until the rolling ship was in the right position. At that moment the loose powder was lit with a burning fuse. The explosion that followed was so powerful that the cannon weighing hundreds of kilos suddenly shot backwards and had to be caught by a thick line, the breeching rope, which prevented it from crashing into the opposite side of the ship. Still deaf from the explosion and in the midst of dense smoke, the crew again stood ready with sponges and scrapers to remove the smouldering remains of the cartridge from the hot cannon and put in a new charge. And all this while the ship was itself under fire from the enemy. The heavy iron cannonballs slammed against the side of the ship, making big, razor-sharp splinters of oak fly in all directions. Or they destroyed the rigging, so that pulleys, rope and pieces of yards rained down on the heads of the gun crews. Meanwhile the ship's boys ran to and fro on felt slippers to extinguish sparks in the powder room, bring the gun crews fresh cartridges and take the empty cases back to the powder room on the lower deck. If the ship tacked and the guns on the other side had to be used, the crew rushed to the opposite cannon and all the actions were repeated in the midst of the incessant, ear-splitting roar of the cannon and the firing of small arms, projectiles flying through the air, impenetrable gun and powder smoke and the screams and groans of the wounded. It was a wonder that the larger part of the crew usually survived a battle. There has never been a period in history when war was pleasant, but the scenes that must have taken place during a battle on board

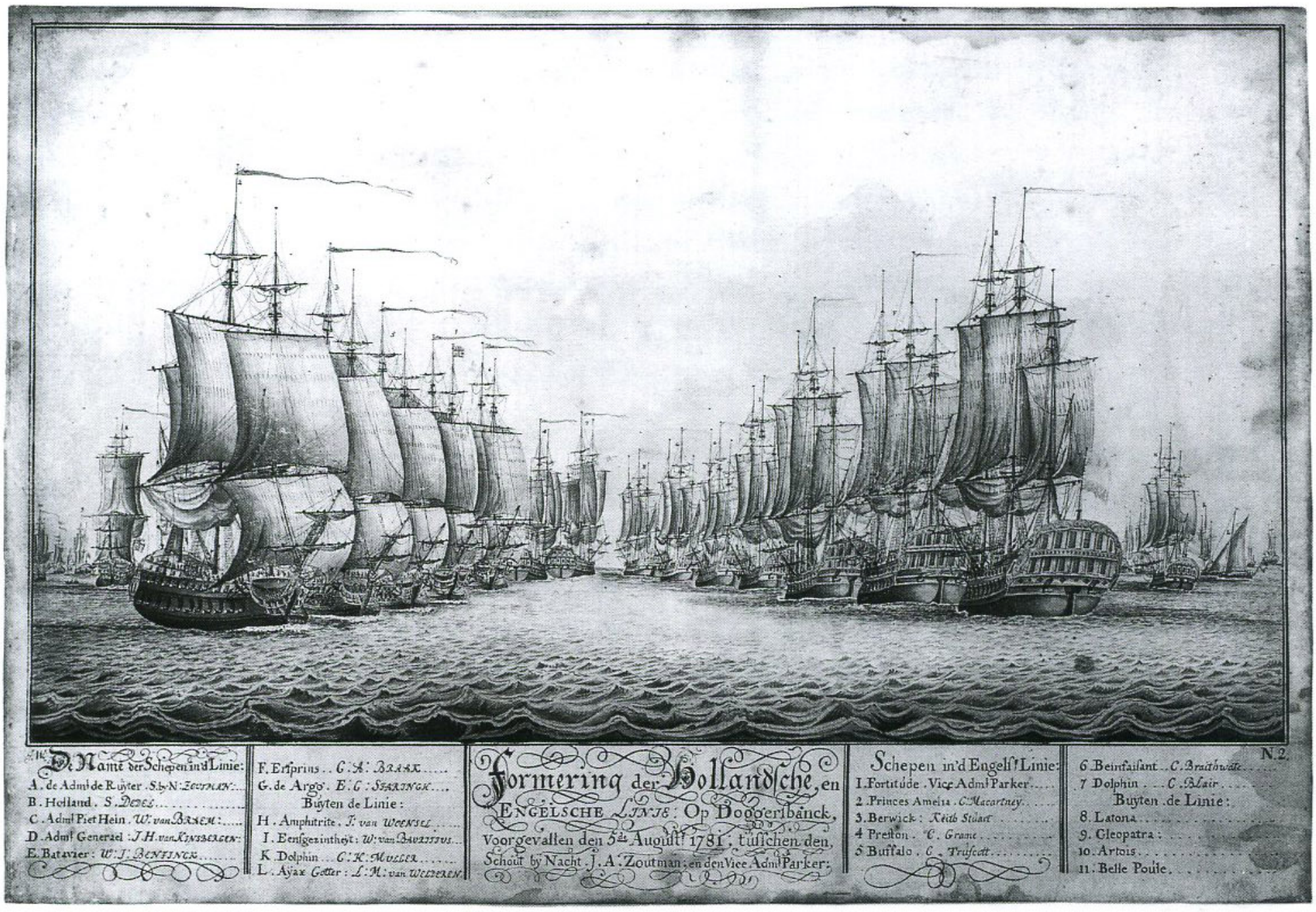
39
Willem van de Velde the Elder (c. 1611-1693), *The encounter between Tromp and Spragge in 1673*.
Oil on canvas, 114 x 183 cm. This is an example of a mêlee, in which each ship sought out an opponent of more or less equal rank. An artillery duel was followed by boarding and hand-to-hand fighting.

these wooden warships defy description. A 17th-century warship in action was an inferno in which a man could literally be ground to pieces.

Lines

In the first half of the 17th century a battle at sea was not that different from a battle on land. Hostile fleets sailed towards each other; each ship selected an opponent of similar size and tried to cause as much damage as possible with its guns before actual combat on deck started once the ships were alongside and could be boarded (fig. 39). Then the fighting was hand to hand, with swords, pikes, axes, knives and pistols. Hired merchant ships, often equipped with cast-iron cannon, were regularly deployed. For example, the East Indiaman *Prins Willem* fought as a warship in the First Anglo-Dutch War (1652-1654).

Around the middle of the century the English introduced a new strategy. The fleet in battle array sailed in line, one ship behind the other, and when they passed the enemy he received an extremely efficient barrage aimed at him continuously from hundreds of muzzles (fig. 40). The only answer to this tactic was to form one's own line, so that fire could be returned in similar fashion. From this point



40
J. Weuyster, *The Battle of Dogger Bank, 5 August 1781*, 1783.
Pen drawing, 480 x 645 mm.
An example of a sea battle fought in line. The two hostile fleets sail past each other in a long line in order to fire as effectively as possible.

the sea battle had its own strategy and the warship developed as a separate type.

As a result of the heavy batteries, the design of the warship changed, although the difference from a merchant vessel is only visible to experts. The ship was generally made broader so that it was as stable as possible, and much of the available space was used for storing cannonballs and gunpowder. With each broadside delivered (if all the cannon on one side were fired), over 400 kilo in weight disappeared at a stroke, and when a ship had used all its ammunition it was some 50 ton lighter. A master shipwright thus needed to have a thorough understanding of the effects that produced.

The cannon were also adapted for use at sea. To prevent damage to the gun ports, the customary ridges and edges around the mouth were abandoned and it was given a smooth tulip shape. The gun carriage had small wheels, in contrast to field artillery with large wagon wheels. The cannon were made in various sizes, or calibres, that were determined by the weight of the balls to be fired. The heaviest were 48-pounders (which were seldom found on board ships), followed by 36-, 24-, 18-, 12-, 6-, 4-, 3- and 2-pounders. They were cast in arms foundries in bronze or iron.

The state foundry was in The Hague, but leading cities such as Amsterdam and Utrecht had their own foundries that met the great demand for weapons. Warships were normally equipped with bronze guns, which were stronger, more dependable and lighter, but also more expensive, than the cast-iron version. In that case the money value of the cannon was higher than that of the ship. As a ship aged, its fighting value fell because ever lighter and cheaper cannon were put on it. Thus De Ruyter's flagship *De 7 Provinciën* began with a number of very heavy 36-pounders among the normal 24-pounders on the lower deck, but at the end of its life most of its guns were light, cast-iron pieces, because the heavy-calibre bronze cannon put too much strain on the construction of the ship.

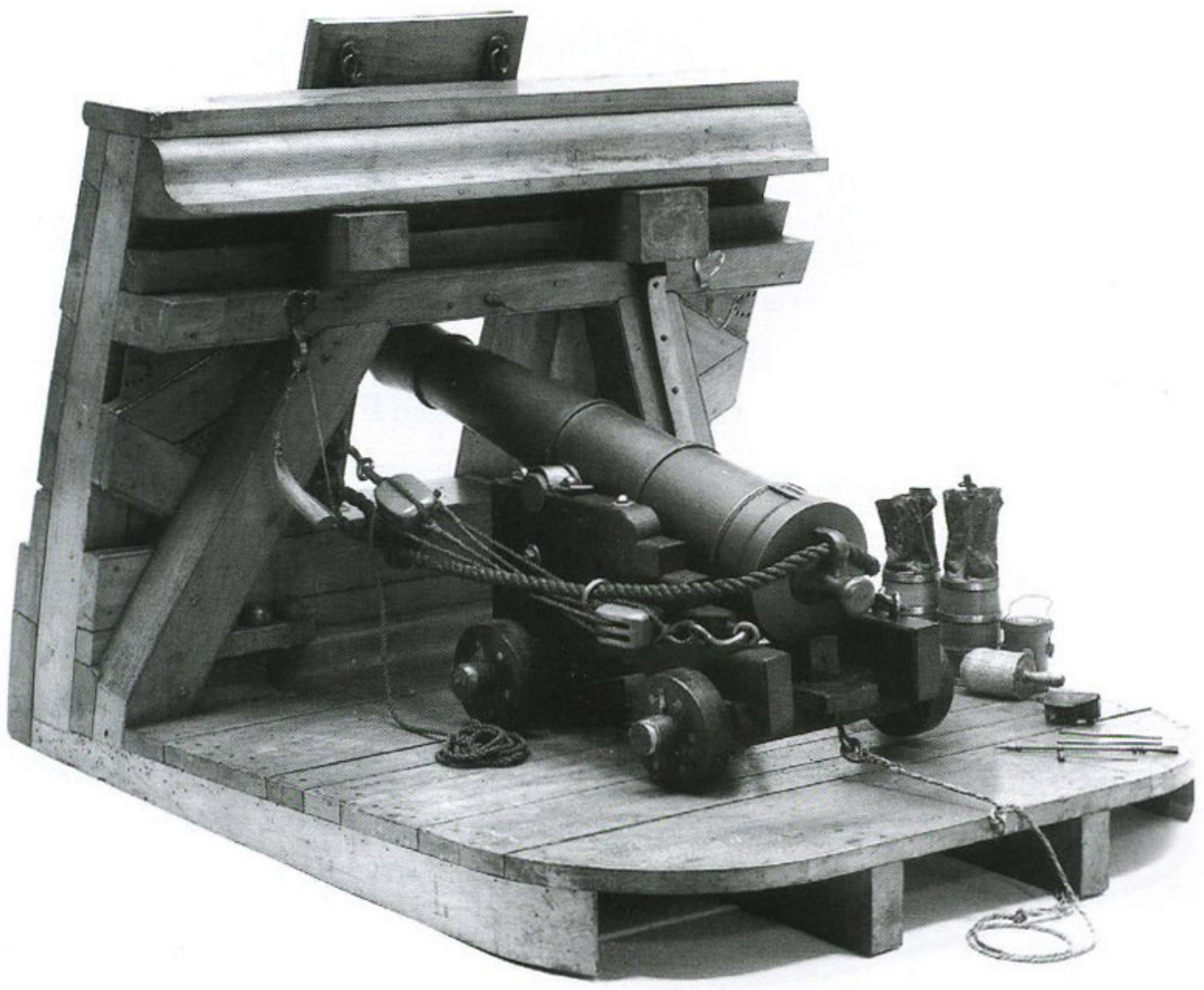
The *William Rex* has 74 cannon in boxwood. The lower deck has 30 24-pounders (including 2 in the stern), the upper deck 24 18-pounders (there could have been 2 more, but the ports by the gangway are empty), the quarter deck 10 12-pounders and the forecastle 6 more of the same calibre; the poop has 4 6-pounders (fig. 41).

LIFE ON BOARD

Water and victuals

On the *William Rex* a large part of the deck in front of the main mast has gratings set into it. They allow light and air to enter the gun deck

41
Model of a cannon at the ship's side, with accessories. A 24-pound gun was operated by between six and eight men. With each gun there was a gunner's ladle, two sponges (one of wool and one of pig-skin), a scraper, a wad-hook and a rammer, a stool block and quoin, balls and canister shot in a rack on the ship's side, and in addition two budge barrels, one cartridge box, one powder horn, one priming iron and one linstock.

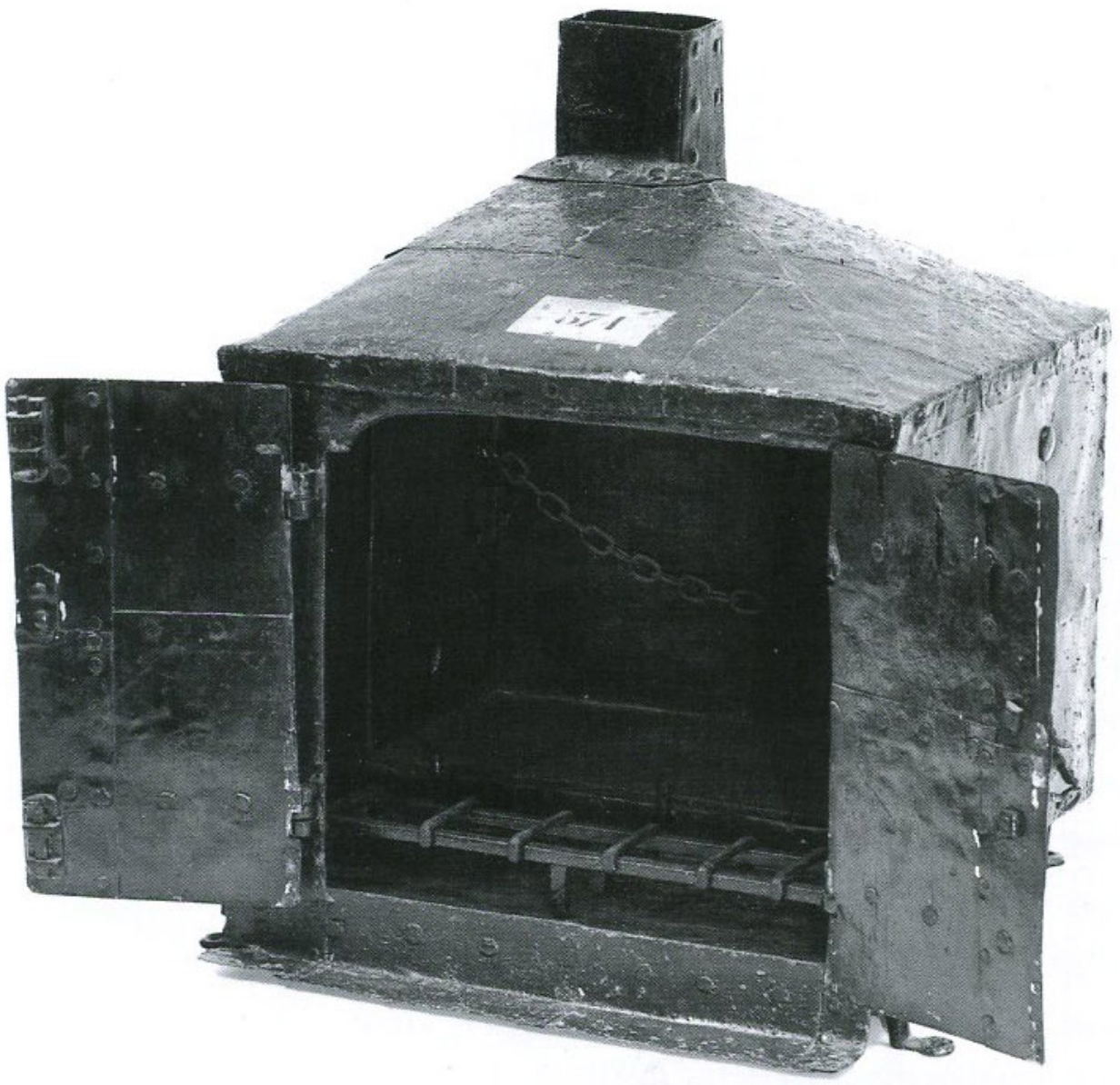


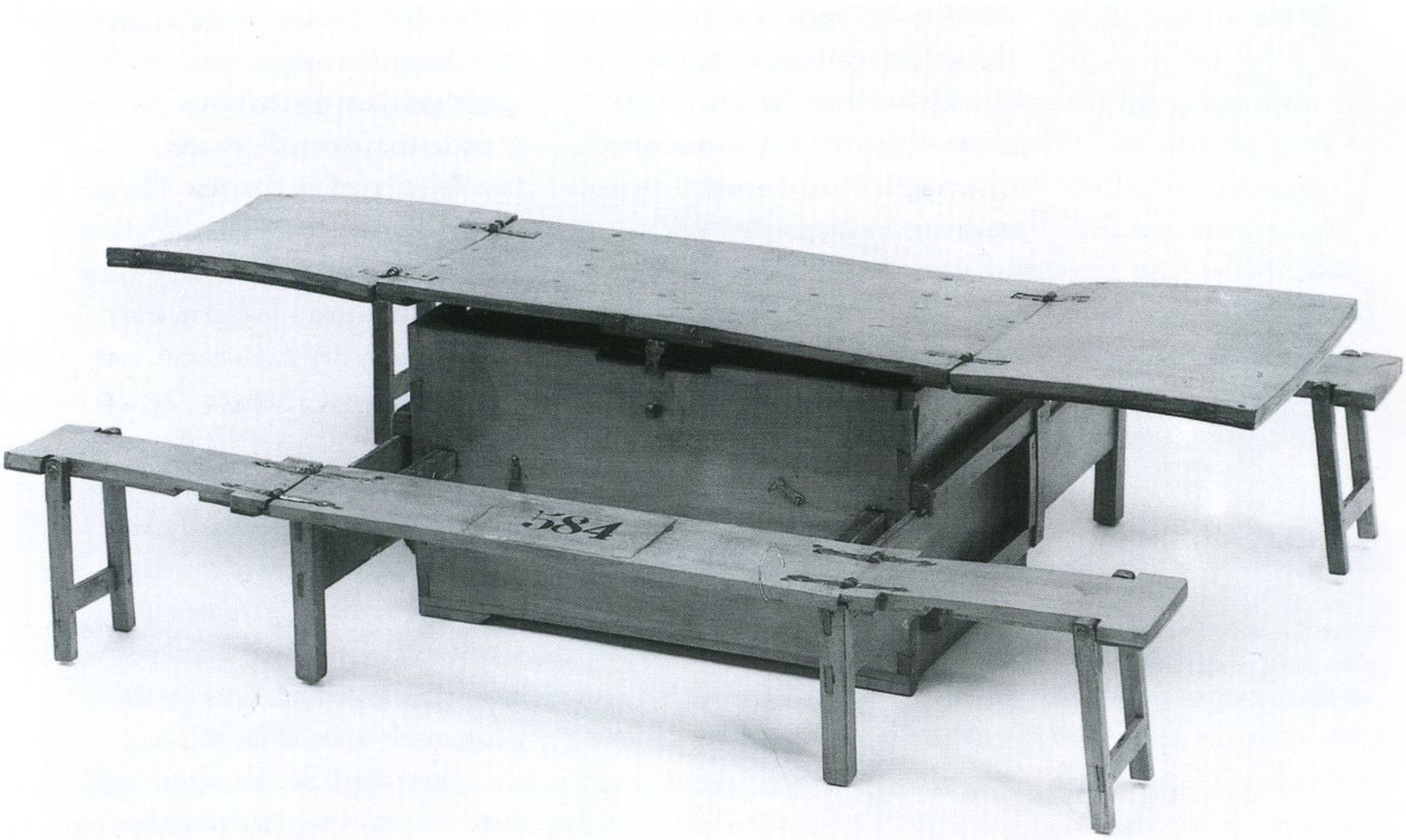
below. On that deck there is a large hatch in front of the mast. On all ships this was seven feet (about two metres) square and was used to hoist in the biggest barrels on board, those containing drinking water, which were always kept below deck in the hold. A ship that was to stay at sea for three months with a crew of 350 to 400 men needed about 150,000 litres of water.

The food on board was prepared in the galley (fig. 42). This was built of fireproof brick in a space that was screened off, and the floor and walls were often covered with tin or copper plate. The galley on a warship was usually located in the hold under the lowest gun deck, to leave the decks free for the cannon. On merchant vessels the galley was often on the lowest gun deck or under the forecastle, an area traditionally reserved for the crew. The galley was the only place on board where a fire could be lit, and then only when weather permitted – in bad weather there was only dry ship's biscuit and cheese to still one's hunger. The seaman was more afraid of fire than of water. The wooden ships did not sink easily, and when they did there were always plenty of pieces of wreckage to cling to in the hope (often vain) of rescue. Fire, however, was almost impossible to control, since the already inflammable wood of the ship was also often tarred. So, not surprisingly, there were strict regulations governing the use of fire. A small flame could have huge consequences, as Captain Bontekoe of the *Nieu-Hoorn* discovered in 1619. A burning wick fell into a cask of brandy and his ship caught fire in the Indian Ocean. When the fire reached the powder room, the ship exploded. Bontekoe and a few survivors managed to row a sloop to Sunda Strait.

On a ship with a crew of several hundred men, storing the victuals and drinking water always took up the larger part of the hold. The big water barrels of more than 300 litres, known as 'hogs', were stored just behind the main mast together with the barrels of beer, wine and brandy, and a great deal of space was also occupied by the barrels of salted meat and bacon, the stockfish, the bags of peas and beans, the pearl barley, buckwheat and flour and the tubs of butter. In the afterhold

There are no models of 17th-century ship's galleys. But the *William Rex* would have had a galley and it would have looked much like this 18th-century version.





43
On the *William Rex* the eating tables probably folded down from the ship's sides. This model of such a table dates from the 19th century and has built-in benches.

of the ship, right at the back above the powder room, were the cheese and bread rooms, which were lined with tin to keep out rats, mice and other vermin. This pretty well covers the seaman's menu. To make up for the lack of fresh produce, every ship also carried some livestock: pigs, goats, chickens and geese, though it must be said that most of these disappeared into the stomachs of the officers. No wonder that many caught scurvy, due to lack of vitamin C, even though every effort was made to combat the unknown cause of this disease. Eating was done in *bakken* or 'bowls'. The crew of each watch was divided into groups known as 'bowls' because they literally ate from the same bowl. Each man used his own spoon to take the barley gruel from the common bowl (fig. 43). The rations were seldom generous. This was in part because the captain often had to advance the money for the provisions himself, and he skimped not only on the amount but also on the quality, so that on the voyage much was found to be unusable. He preferred to use the funds made available for this purpose by the state as a welcome addition to his pay.

Once or several times a day a ration of drink, a tot of rum or brandy, was issued to keep the crew content and healthy. Beer was drunk mainly at the beginning of the voyage because it would not keep for a long time. It was normally 'thin beer', with a low alcohol content, which was drunk because the drinking water went bad even sooner. By the end of the voyage the seaman had to suck the water through his teeth to avoid swallowing the algae that had slowly grown in it.

Rope ends and hammocks

The seaman relieved himself to the fore of the beakhead, where a few planks with holes functioned as toilets. The water regularly sweeping over them kept the place reasonably clean. Beside the holes there were some unravelled ends of rope hanging in the water which were used by the whole crew as toilet paper. Only the captain had a toilet of his own in the saloon or on big ships in the quarter gallery.

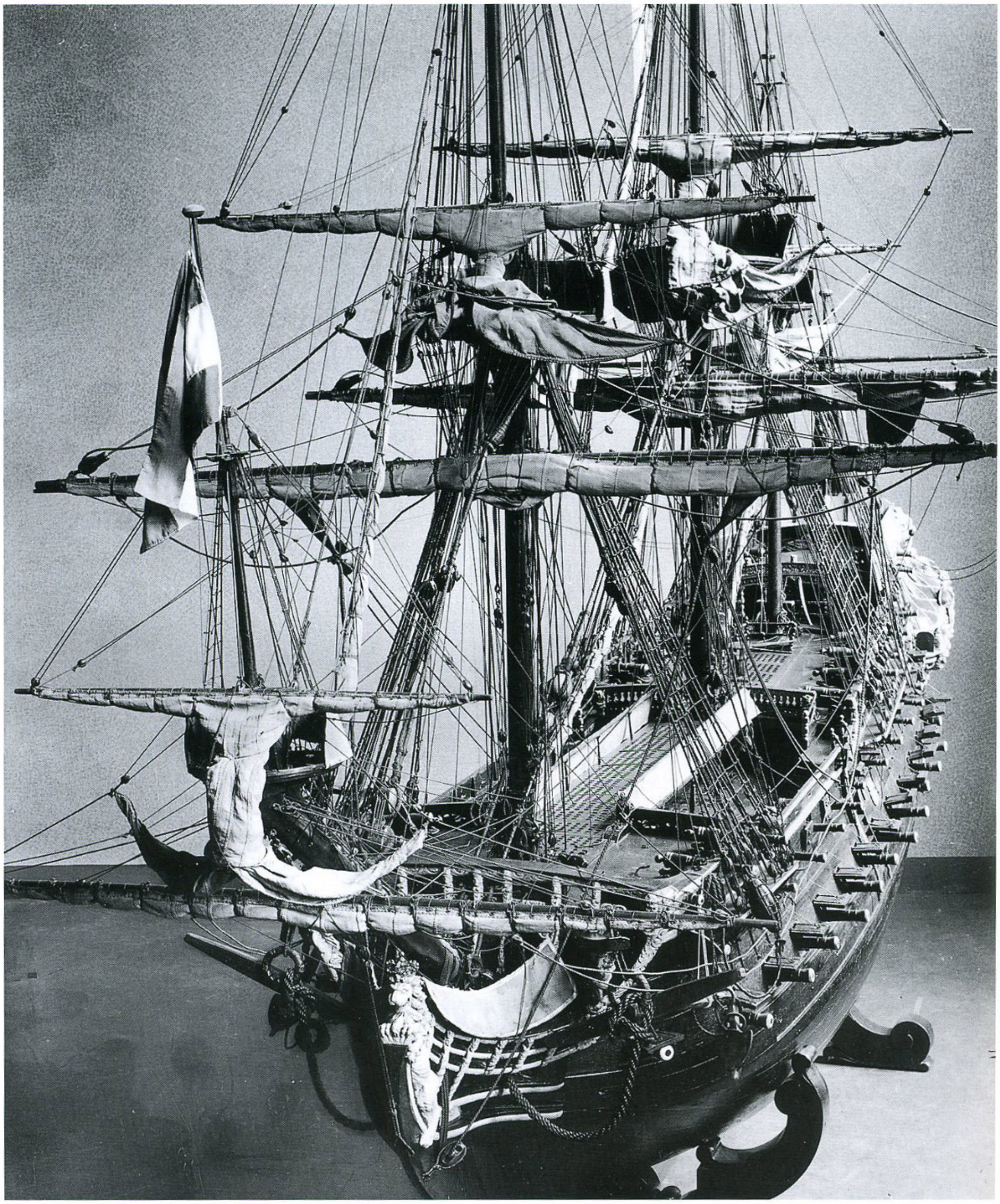
The ordinary sailor had no bed. He slept in a hammock amid the cannon or he had a berth in his workspace if he held a post as a cook or steward, carpenter or sailmaker, ropemaker or bosun, lay-reader ('sick-comforter') or writer, surgeon or helmsman. Only the captain had a normal bed, often indeed equipped with a real canopy.

Nor did the sailor have the right to his own spot to hang up his hammock. There was always one watch who had to sleep, and when they had to go back on duty another watch took their place. Meanwhile the watch-on-deck were at work keeping the ship clean and in order. The watch below deck carried out various tasks which could range from repairing clothing and equipment to taking part in such communal activities as military drill and training or religious services. Meanwhile, the remaining part of the crew did their best to snatch some badly needed sleep. The watches were arranged so that one never had to do the night watch twice in succession, except of course in an emergency, for then it was 'all hands on deck' and the entire crew stood ready to do what the captain required of them.

THE WILLIAM REX AS A MUSEUM EXHIBIT

The Navy and the Rijksmuseum

Throughout the 18th century the *William Rex* retained its prominent position in the assembly chamber of the Zeeland admiralty. Joachim Pieter Asmus, the superintendent of the Vlissingen admiralty yard, found the model in a state of neglect in 1796, by which time Zeeland's maritime glory had vanished more or less without trace. With the advent of French rule in 1795, many works of art began to be moved about as a result of the various reorganisations of governing bodies and institutions. Many Dutch art treasures and scientific objects were transferred to France during the Napoleonic period. Asmus was just in time to prevent the *William Rex* being sold abroad by Secretary Van der Veer of the admiralty, 'like the other models he sold off in those days'. Asmus had the model moved to the Vlissingen arsenal, where it was restored. When two years



44
The *William Rex* before it was put on display in Room 102 in 1971. The model turned out to be equipped with waist-cloths. It is not clear why they were removed.

later he was transferred to Amsterdam as dockyard superintendent, he took it with him. By then the historical value of the model was recognised in higher circles: in 1825 it was presented by the Navy Minister to the Royal Cabinet of Curiosities in The Hague, where, dressed with the flags of various nations, it was displayed for many years.

In 1858 the model was again found to be suffering from neglect and it was moved to the Navy's collection of nautical models, the Navy model room, where it was the only 17th-century ship model. In the 1880s virtually the whole naval collection, including the *William Rex*, was handed over to the Rijksmuseum in Amsterdam. After the renovation of the museum in 1971, it stood in the large lower room of the Department of Dutch History in the East Wing (fig. 45). There it was so dominant among the many hundreds of paintings and other art objects, together with a few much smaller ship models, that among themselves the attendants called this the 'ships room'. During the major rebuilding programme currently being undertaken the ship is on display in the Philips Wing, which remains open to the public. There it symbolises the maritime power of the Dutch Republic in the 17th century.

Condition and restoration

For a model over 300 years old the *William Rex* is in exceptionally good condition. The woodwork is sound and appears to be unaffected by woodworm or rot anywhere. The same is true of the masts and yards. Textiles such as those used for the rigging and sails can last for over 150 years under normal circumstances; after that, conservation treatment is necessary. Here the sailcloth has been partly glued to a supporting fabric and many of the lines of the running rigging have been replaced. Although two of the five anchors supplied in 1698 are missing, the model is remarkably complete. All the cannon are still in place and even the binnacle for the compass is present.

We know that the model has been restored twice and it is thought that a third restoration took place at the end of the 19th century. It was first restored in Vlissingen in 1796 at Asmus's instigation. The rigging must have been removed so that it could be taken out of the room. At the least all the dust was probably taken off the model at that time. It would also have been unrigged when it was transported to Amsterdam. Prior to being displayed in 1971 in Room 102 (fig. 44), the former courtyard of the East Wing of the Rijksmuseum, the model was restored by Fons Kramer, a specialist in the field, assisted by Herman Ketting. Many of the ropes were newly made at that time.

When the model was moved to the Philips Wing in 2003, it was found that almost the entire standing rigging was still original. The shrouds, which support the masts sideways and form the basis for the rope ladders, proved to be extremely fragile, and the thick stays could hardly bend without breaking. Nonetheless, through careful preparation, it was possible to avoid damaging the masts and rigging

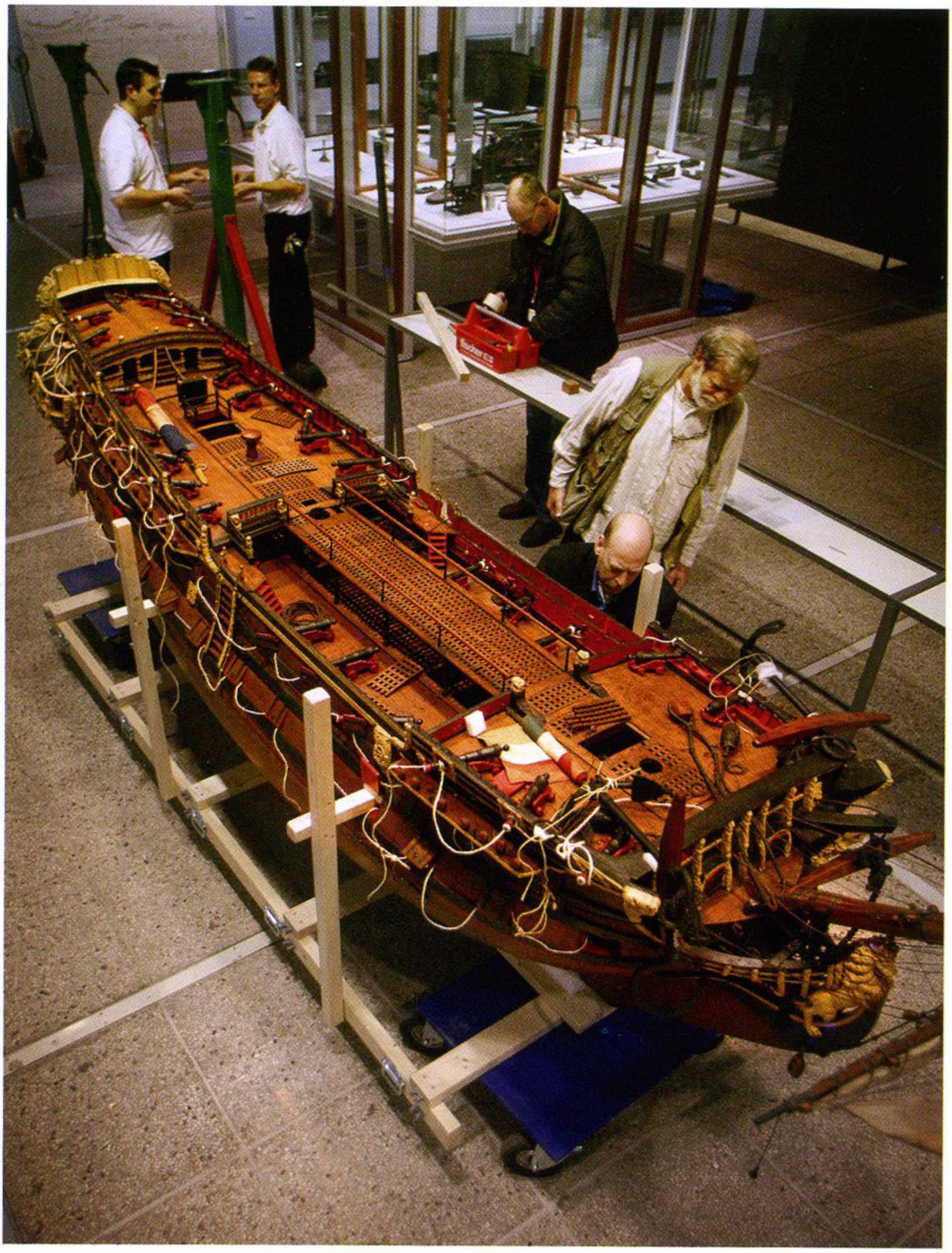
45
The *William Rex* in Room 102 in the Dutch History Department of the Rijksmuseum, c. 1993.

almost entirely when they had to be removed to get the model through the doors (figs. 46, 47).
Pigment studies done before this most recent move showed that the yellow paint applied to all the decorations is not original because it is zinc-based. Zinc paint was not introduced until 1850, so it looks as if the decorations at least were given a fresh but less authentic lick of paint before the model was put on display in the Rijksmuseum at the end of the 19th century. This may have been done by the museum's first 'model maker', F. Baaij, around 1890. The original

46
The masts of the *William Rex*, complete with sails, are taken off so that it can be moved to the Philips Wing in December 2003. They took two days to dismantle and twice as long to reassemble.

colour, gold ochre, is a warmer shade than the zinc paint, which is too pale and mat. In consultation with the Paintings Restoration Department, an attempt has been made to restore the old lustre by covering the existing paint with a layer of dammar coloured with yellow pigment. An easily removable natural resin, the dammar gives the woodcarving its original lustre once more, so that the effect of gold ochre is imitated.

The fact that the *William Rex* has come down to us relatively undamaged makes it unique of its kind. It would seem that its size, which makes it so conspicuous and hence vulnerable, has helped to prevent its being lost sight of. Placing it in the midst of the masterpieces of the Rijksmuseum offers an opportunity to present the public with the nation's maritime past while also ensuring that the model will be preserved (fig. 48).



47
Ready for transport to
the Philips Wing.

48
The *William Rex* on display
in the Philips Wing.

Glossary

AFTERHOLD Space low in the aft of the ship containing the powder room.

BEAKHEAD Lightly constructed extension to the fore of the ship, partly decorative and partly functional. The place for several belaying points of the running rigging and for the toilets for the crew.

BINNACLE Housing used by the helmsman in which the compass was mounted, often fitted with lanterns.

BITT Heavy wooden construction in the forward part of a ship on which the anchor cable was belayed.

BLOCK Also pulley. A block of wood with a grooved wheel through which lines are led to exert more pulling power.

BOWLINE Line that pulled the weather-side of the sail forwards so that one could sail closer to the wind without the wind blowing into the sail from the front.

BOWSPRIT A spar projecting obliquely upwards and forwards from the ship on which the spritsail was carried. Originally served mainly to guide the ropes that pulled the weather-side of the fore sail and the fore topsail forwards (the so-called bowlines).

BRACE Line with which the yards were turned according to the wind.

BREECHING ROPE Cable that anchored a cannon to the side of the ship and checked its recoil.

BROADSIDE Side of the ship, where all the cannon were. Also the simultaneous firing of all guns on one side.

BUDGE BARREL Small barrel containing fine powder that was used to fire a cannon. It was closed by a piece of leather to protect it from flying sparks.

BUNTLINE Line on the front of a sail used for reefing.

CABLE-TIER Space low in the forward part of the ship where the anchor cables were stored.

CAISSON Sinkable floating construction used to close dry docks.

CANISTER SHOT 'Anti-personnel' projectile filled with small objects such as balls or shot that was intended to cause many casualties when it hit the target.

CAPSTAN Windlass. Piece of equipment on board ships used for heavy lifting: raising the anchor, hoisting topmasts and yards, taking guns and boats etc. on board and off.

CARTRIDGE Paper or linen case in which an amount of powder measured by the master gunner was placed to fire a cannon.

CAT TACKLE Block and tackle used to hold the anchor to the side of the ship after it had been hoisted out of the water.

CATHEAD A beam extending from the bow on both sides to which the cat tackle was attached.

CLEW Line on the back of a sail used for reefing.

CROSSJACK YARD Lowest athwartship yard on the after-most mast. It carried no sail itself, but served only to spread out the lower corners of the mizzen topsail above it.

DECK CLAMP Thick plank on the inside of a ship into which the deck beams were fixed.

FIGUREHEAD Carved figure at the front of the beakhead. In the 17th century it was normally a lion.

FISH DAVID Loose beam on the forecastle on to which the bottom of the anchor was hoisted when it was kept on the ship's side.

FORE MAST The mast nearest the bow on a three-master.

FORE SAIL Lowest sail on the fore mast.

FORE TOPGALLANT MAST Highest extension of the fore mast on which the fore topgallant sail was set.

FORE TOPMAST First extension of the fore mast. The fore topsail was set on the fore topmast.

FORE TOPMAST STAY Line giving forward support to the fore topmast.

FORE TOPMAST STAYSAIL Fore-and-aft sail set on the fore topmast stay.

FORE TOPSAIL Second sail set on the fore mast.

FORECASTLE Deck above the forward part of the ship. Traditionally the place where the crew had their quarters.

FRAME Athwartship combination of pieces of wood sawn from knee timber to which the planking was fastened. A medium-sized wooden ship had about 75 frames.

FUTTOCK One of the ribs in the frame of a wooden ship.

GRAPNEL Four-armed anchor, used mainly by lighter vessels.

GUDGEON Loop-like part of the hinge on the stern in which the rudder turned.

GUN CARRIAGE Support under a cannon. The carriage had large wheels for field artillery, and small ones for cannon on board ships.

GUN ROOM Space for the use of the master gunner, normally the aftermost part of the lowest gun deck.

GUNNER'S LADLE Stick, with a spoon attached, used to insert the cartridge case containing the charge of powder into the barrel of a cannon.

HAKKEBORD [carved transom moulding] Carved plank in the stern that carried an athwartship ledge, often near the windows there. The upper *hakkebord* was freestanding and consisted entirely of 'translucent' carving.

HAWSE HOLE Opening in the bow of a ship through which the anchor cable ran.

HAWSER Anchor cable.

HELM Lever on smaller vessels by means of which the rudder can be moved.

KEDGE Light anchor used for hauling a ship. Often it was carried under a sloop to a position further on, where it was dropped; then the ship was wound forward using the capstan.

LINSTOCK Tool used by a cannoneer to ignite the loose powder in the vent hole of a cannon to detonate the powder charge.

MAIN MAST The middle mast of a three-master.

MAIN SAIL Lowest sail set on the middle mast.

MAIN STAYSAIL Fore-and-aft sail set on the main stay, a heavy rope which gave forward support to the main mast.

MAIN TOPGALLANT MAST Top extension of the middle mast on which the main topgallant sail was set. In bad weather the topgallant mast was often stored on deck.

MAIN TOPGALLANT SAIL Top sail set on the main topgallant mast. Used mainly in fine weather with little wind.

MAIN TOPMAST First extension of the middle mast on which the main topsail was set.

MAIN TOPMAST STAYSAIL Fore-and-aft sail set on the main topmast stay, a heavy rope which gave forward support to the main topmast.

MAIN TOPSAIL Top sail set on the middle mast.

MASTER GUNNER Official responsible for the cannon.

MASTTOP Platform on the mast at the foot of the topmast. The topsail was kept on it and the shrouds of the topmast were fastened to it.

MESSENGER Rope with its ends tied together that was moved by the capstan and so hauled in the anchor cable, which was fastened to it.

MIZZEN Fore-and-aft triangular sail on the aftermost mast, used mainly for steering.

MIZZEN MAST Aftermost mast on a three-master. The mizzen carries the mizzen sail and the crossjack yard.

MIZZEN TOPMAST Extension of the mizzen mast on which the mizzen topsail is set.

MIZZEN TOPSAIL Topmost sail on the aftermost mast.

OPLANG The lowest vertical part of a frame.

PINTLE Pen-shaped part of the hinge by which the rudder was attached to the stern.

POOP Afterdeck where the commanding officer stood.

POWDER ROOM Storage space for gunpowder deep below and aft in the ship.

PRIMING IRON Tool used by a cannoneer to punch a hole in the cartridge case through the vent hole of a cannon.

QUARTER GALLERY Extension, often decorated, at the stern on the sides of a ship. In form and construction the quarter gallery matched the stern.

QUARTERDECK Upper deck on the same level as the forecastle running aft from the main mast.

QUOIN Wedge-shaped block driven between the stool block and the back of a cannon with which the elevation of the cannon could be adjusted.

RATE The classification of a warship. In the 17th century a ship of 80 pieces or more belonged to the 'first rate'.

RATLINES Knotted horizontal lines that made it possible to use the shrouds as rope ladders.

REEF To make a sail smaller by rolling up the lower part or gathering part of it into horizontal pleats and tying it to the yard.

RIGGING The system of all the ropes and blocks on board a ship.

RUNNING RIGGING The whole system of ropes used to move the sails and yards.

SCRAPER Corkscrew-shaped hook used to remove the remains of cartridges from the barrel of a canon after each shot.

SEIZING A binding used for holding together two ropes, two spars etc. by lashing with a separate rope.

SHEER The fore-and-aft line of a ship that curves downwards in the middle and rises at the bow and stern. The sheer was important for the strength of the construction and for the appearance of the ship.

SHEET Line used to pull in the lower corner of a sail.

SHEET ANCHOR The heaviest anchor on a ship, used in severe weather.

SHROUDS Heavy ropes that supported the mast sideways and backwards. When equipped with ratlines they also served as rope ladders.

SMALL BOWER Anchor used in combination with the everyday anchor to secure a ship more firmly.

SPECIFICATION CONTRACT Written requirements for a ship, normally for legal purposes as an agreement between builder and client. A specification contract contains a great deal of detailed information about a ship.

SPONGE A wad of wool or pigskin fixed to a stick or a piece of rope which was used to clean the inside of a cannon after each shot.

SPRITSAIL Lowest sail carried on the bowsprit.

SPRITSAIL TOPMAST Typically 17th-century vertical extension of the bowsprit, to which the spritsail topsail was attached.

SPRITSAIL TOPSAIL Top sail carried on the spritsail topmast. Used mainly for steering.

STANDING RIGGING The system of ropes supporting the masts.

STAY Heavy rope giving forward support to a mast or topmast.

STERN Flat rear of a ship, consisting of the tuck, on each side of the rudder, and above it the decorated transom.

STOOL BLOCK Wooden block on which the back of a cannon's barrel rested.

SWEEP Horizontal athwartship beam in the gun room on which the tiller rested.

TACKLE System of rope and two or more blocks with which heavy loads could be hoisted or moved.

TAFFRAIL The flat part of the transom on which the arms or the name of the ship in symbolic form were depicted.

TILLER Lever on the rudder of a larger ship by which it could be steered.

TOPGALLANT MAST Top extension of a mast on which the topgallant sail was set.

TOPMAST Extension of a mast.

TRANSOM Ornamented upper part of the stern in which the windows were located. Traditionally the place for heraldic arms and other adornments.

VENT HOLE Small opening at the back of a cannon through which the powder was ignited.

WAIST-CLOTHS Cloths made of heavy material that were hung around the ship to block the view of the decks and catch flying shrapnel and shot.

WEATHER-SIDE The side from which the wind is blowing.

WHIP-STAFF A vertical extension of the tiller hinged in a round chock which enabled the helmsman on a deck above to steer the ship.

YARD Spar fastened crosswise to the mast or topmast that carried the sail, which was attached to the top of it.

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In the Rijksmuseum there is an exceptionally large ship model dating from 1698, the *William Rex*. It is unique, not only because of its size, its age and its detail, but also because of its historical and political significance.
This Dossier deals at length with the origins and function of this 'showpiece' and also discusses the prominent role played by shipping and the admiralties in the Dutch Republic. Among the topics covered are other 17th-century ship models, the construction of large warships of the period and life on board. A glossary of nautical terms completes this fascinating study of the *William Rex*.