

## Chapter 7 of Category II

*It is a standing slave holding a fish and a goblet from which he serves wine to the king. It is divided into three sections*

### Section 1

*On the outside appearance and functioning of the cup-bearer*

He is a standing slave, ten years old in appearance, dressed in a short jacket (*farajiya*) with a robe (*qabāʿ*) underneath it, and a cap (*qalansuwa*) on his head. In his right hand is a glass (*qadaḥ min zajāj*), the fingers curled around the bottom of the glass so that it can be taken out of his hand and put back. His upper arm [points] downwards, his forearm is extended, with the hand and glass slightly raised. His left hand is in the same position, but higher than the glass, and holds a silver fish. Its head is higher than the glass by about 4 F and its tail is downwards. He stands by the king's side until about one eighth of an hour has passed, whereupon the head of the fish tilts until it is near the glass, and clarified wine (*sharāb murawwaq*) flows from its mouth into the glass until it is almost full. Then its head lifts and the slave's hand with the glass sinks about one small span from its previous position. The king takes the glass from the slave's hand, drinks its contents, and puts it back in his hand, which has returned to its previous position. This happens at time intervals like the first, until the carousal is over and [the company] rises.

### Section 2

*On the construction of the figure*

From jointed copper a figure is made with the appearance of a ten year old slave, standing on his feet. He is made from a plate, hammered thin – it is 4 sp. long and 1½ sp. wide. Its ends are bent round and soldered so that it takes the shape of a cylinder. This is formed to resemble the lower part (*dhayl*) of a shift, from the hose to the waist, which is made slightly wider at the bottom by hammering. It is not circular but hangs down without concealing [the feet]. Then above this cylinder another one is made, and hammered into the shape of the belly and chest of a slave. Above this one fits the shoulders with a round hole like a collar between them. Then a head is made, i.e. a soldered cylinder. One end is wide – this is his head. The neck is made narrow by repeated hammering. [The head] is provided with a face, forehead and part of the neck. If the craftsman is not competent enough to make the face by hammering he can make [various] parts thicker with lead, e.g. the nose etc. The inside of the head, neck, shoulders and breast are tinned and also a plate which is fitted below the breast. Thus the breast, head and shoulders form a wine reservoir. The head is soldered securely to the collar. Then one takes a plate and fits it inside the skirt, 4 F above its hem. It is not soldered [yet]. Then to this plate one fixes legs, starting at the knee and [having] a lower leg and a foot – i.e. one makes a pipe in the shape of the lower leg and the knee. For the foot one takes a pipe with one end narrower than the other end and shapes it to resemble a foot. To its top one fits something resembling the top of a slipper (*khuff*) and to its underside one fits something resembling the bottom of a slipper. When the leg is completed, one imagines this to be a slipper. The other leg is made in the same way. Each leg is then soldered to the plate at the knee, the legs wide apart as is usual. The craftsman should not be afraid that the slave will tilt in any direction. I made him and placed the soles of the feet on the ground, and was afraid that he would tilt, but when he was standing erect he did not tilt at all. The plate with the legs [fixed] to it remains [untouched] until it is soldered. Then one makes from copper forelocks and two lovelocks (*dhawāʿib wa sudghān*) for the slave. Then two sleeves are made for the shift, cut short at the elbows; inside each sleeve a slit is made through to the torso.

I have described the fabrication of this figure to make its construction easy for the craftsman, having omitted to explain this in earlier chapters.

## Section 3

*Construction of the slave's hands and their mechanism, of the fish, and of the palm of the slave's hand through which the wine runs into the forearm and into the fish*

A hollow right arm, hand and fingers are made in one piece, holding the bottom of the glass, the little finger preventing the glass from descending too much. There is an axle across the elbow in the sleeve of the shift, its ends firmly fixed. The end of the upper arm is weighted inside the torso of the slave, so that the arm and the glass are raised – they sink when the glass of known weight is filled with the known [amount] of wine. A light, hollow fish is made from silver. In its breast towards the head is a cavity [leading] towards outside, and from there to its middle is a cavity towards the inside. In its middle is a partition plate which prevents the wine from running into the half of the tail end. Then the left hand, with palm, fingers and part of the forearm is made, grasping the middle of the fish. The forearm is hollow and as light as possible – the hollow goes through to the hollow in the fish, near its head.

Then a trough is made and placed in the slave's body, its highest point almost touching the plate which divides his breast from his belly. The height of the sides of this trough is about 3 F. Then a [tipping]-bucket, as described in several previous chapters, is placed in the trough. Its sides are short, 1 F high, and its capacity is only about 60 *dirhams* of wine. When it is filled its tip tilts and it discharges its contents into the trough. Then the left arm is made, which is really the sleeve of the robe from the wrist and forearm up to the elbow. The elbow is inserted in the sleeve, one end of the elbow in the sleeve and the other end touching the side of the [tipping]-bucket's trough. A hole is made in the side of the trough into the hollow in the elbow and soldered to it. Then one takes a narrow pipe long enough [to reach] from the hole in the side of the [tipping]-bucket's trough to outside the forearm, namely the sleeve of the robe. Then the [part of] the forearm attached to the fish is placed loosely in the sleeve of the fish. Then a rod is fixed vertically to the end of the pipe, with a hole in its upper end. In this hole an axle is inserted cross wise, its ends soldered to the sides of the fish, which moves in the axle like the arm of a balance. The rod is soldered to the narrow pipe out of which the wine flows into the fish. This rod acts like the column of a balance. When the fish moves the forearm and the hand clutching the fish move in the sleeve of the robe. The fish is tilted [down] towards its tail. When wine discharges from the bucket's trough into the narrow pipe in the hollow of the arm, it issues from its end into the middle of the fish, and a small quantity of it collects in the breast of the fish, since this is hollow towards its underside. The head becomes heavier and sinks until it is near the glass. The wine flows into the glass, slowly because of the narrowness of the fish's mouth, until the glass is nearly full. The fish's head becomes lighter and rises, together with the arm, to its previous position.

Now the plate with the slave's legs on it is soldered to the inside of the skirt and the slave is stood up. Then he is painted with various colours, as is the jacket above the robe. A cap is placed on his head. If desired a fine shirt of some kind may be added, which is so light that when he wears it the movement of his body [i.e. the arms] is not impeded.

For a clear understanding I have shown a picture of the slave and what is inside him [Fig. 98]: – his right hand and the glass *p*, the axle *q* in its elbow, the weight *j* in its upper arm; the wine-reservoir *f* in part of his breast and his entire neck; the [tipping]-bucket's trough *s* and the [tipping]-bucket *x*; the narrow pipe *t* soldered to the bucket's trough and extending to the hollow in the fish; the rod *m* with a hole in its end in which the axle is [inserted].

It is very clear that when the cap is lifted from the head of the slave clarified wine, such as is drunk by kings, is poured into his head. (The wine reservoir, as [mentioned] previously and everything into which the wine falls is tinned.) The cap is put back on his head and the wine drips from the underside of the reservoir into the bucket's trough and flows through the narrow pipe into the breast of the fish, making it heavier. It tilts until its head comes down near the glass, pouring its contents slowly into the glass until it is almost full. It becomes heavier and his hand descends as if he were offering the glass to the king. The king takes the glass, drinks from it, and returns it to his hand, which has risen to its previous position. This continues until the wine reservoir is empty, whereupon the company disperses.

This is what I wished to describe clearly.

Now I will describe what I made, namely a man holding a goblet and a bottle, who pours wine from the bottle into the goblet, and drinks it.



Fig. 98. Caption reads: *And in the author's handwriting: 'I have drawn the bucket in its trough, and a pipe extends from it to the breast of the fish; on its end is a rod upon which it (i.e. the fish) moves and through which is the axle'.*

*N.B. Caption is omitted from Fig. 98. It is beneath the figure in the MS.*

## Chapter 8 of Category II

*It is a man holding a goblet and a bottle. He pours wine from the bottle into the goblet and drinks it. It is divided into two sections*

### Section 1

*Description of its outside appearance and functioning*

It is a standing slave holding a silver goblet in his right hand by the stem of the goblet. In his left hand is a bottle with its top pointing to the top of the goblet. Every one eighth of an hour wine flows from the bottle into the goblet. He lifts his right hand with the glass in it to his mouth so that the rim of the glass is between his lips [and holds it there] for a while as if drinking the contents of the goblet. Then the goblet leaves his mouth and his hand returns to its former position. In this model the bottle does not move, neither does it prevent the rise and fall of the goblet, although the latter rises close to it.

The construction of the figure was described in the previous chapter so there is no need to explain it here. The construction of the goblet: the top of the goblet is covered with a flat lid which is extensively filigreed. In the pedestal of the goblet is a hole which goes through to the palm of the man's hand, up his forearm into his upper arm to a jar connected to the underside of the upper arm. In it [i.e. the jar] is collected the wine which is poured into the goblet. The arm moves about an axle in its elbow. In the jar is a siphon and when the wine collects therein it rises to the bend in the siphon. [Meanwhile] the jar has become heavier and descends and the hand with the goblet rises to the man's mouth. The wine discharges through the siphon into the tank inside the man's body, and the wine collects on it. When the man is removed from the assembly the wine is extracted from his right sleeve. The construction of this hand was described more fully in a previous chapter [Chapter 6] than it has been described here.

### Section 2

*Construction of the left hand holding the bottle, of the wine reservoir and the [tipping]-bucket*

It should be understood that the hands of this man are higher than the hands of the cup-bearer [in Chapter 7], so it is not possible to make the wine reservoir from the lower part of this man's chest. Instead, the wine reservoir is made in the upper third of this man's chest to his neck. [This space] and his head and neck under his cap are thoroughly tinned. In the top of his head is a slit through which the wine is poured into the reservoir. Its floor is a plate, beneath which is a trough with a [tipping]-bucket in it, whose construction has been described previously. The bucket's trough is short and is 1 F wide and the bucket is flat with low sides – it has a capacity of 20 *dirhams* of wine. In the floor of the reservoir a hole is made through which the wine discharges into the bucket. In the side of the bucket's trough is a pipe which is bent into the man's elbow. Its end emerges from the sleeve of the robe. A silver bottle is made, and the lower part of its neck closed by a plate so that wine cannot enter the main part of the bottle. A hand is made grasping its neck, and part of the hollow forearm – [the hole] penetrates to the neck of the bottle. The forearm is inserted in the sleeve and the end of the pipe [is inserted] in the neck of the bottle, where it is soldered; the bottle does not move.

Then this figure is made as beautiful as possible by painting with different colours and similar [decoration]. On top of the head a cap is placed, and he may also wear a shirt which does not impede the movement of his right hand.

I have shown a picture [Fig. 99] of this man: the hand of the goblet *j*, the axle *d* in his elbow; the jar *e* and the upper arm; the siphon *w* in the jar; the wine reservoir *z*; the trough *h* and the [tipping]-bucket; the narrow pipe *t* connected to the side of the bucket's trough and extending through the left hand into the neck of the bottle; the bottle *y*.

It is very clear that the cap is lifted from his head and wine is poured into the reservoir until it fills to the top of his head. Then his cap is put back on his head and he is brought into the assembly. After about an eighth of an hour about 20 *dirhams* of wine flows from the collar [i.e. the upper part of the body] into the goblet. His hand and the goblet rise until the rim of the goblet is between his lips where it remains for a while. Then the goblet leaves his mouth and his hand descends to its previous position. This happens every one eighth of an hour. The wine collects

in the trough, i.e. his belly, and when the party is over the man is tilted on to his right-hand side and the wine in his belly flows out of his sleeve.

That is what I wished to describe clearly.

[Now] I will describe what I made, namely a dais with two *shaykhs* on it, who serve each other with drinks.



Fig. 99.



## Chapter 9 of Category II

*It is a dais upon which are two shaykhs, each holding a goblet, and a bottle from which he pours wine into the goblet of his friend, who drinks it. It is divided into two sections*

### Section 1

*On its outside appearance and functioning*

It is a long rectangular platform surrounded by a fretted balustrade; the height of its supports is about 4 F. On it are two old men facing each other. Each one holds a goblet in his right [hand],<sup>1</sup> and a bottle in the left, with the palm and fingers grasping the neck of the bottle, the top of which points towards his friend's goblet. On the corners of the dais are four columns each about 1½ sp. high and above the columns is a castle about 1 sp. high. Above the castle is a handsome dome. The dais, as I have described it, is set down in a drinking party, and when about one eighth of an hour has elapsed one of the shaykhs pours wine from his bottle into his friend's goblet. His friend drinks it and nods his head several times. When about an eighth of an hour has elapsed [once more] the other shaykh pours wine from his bottle into his friend's goblet. His friend drinks it and nods his head several times; and so on until the company disperses.

[Now] I will describe the construction of the dais, the two shaykhs, the columns and the castle. A dais is made with a floor of copper and supports of cast bronze, the height of each support being about 4 F excluding its foot and its top. The centres of the supports are enclosed by plates which cover the underside of the dais. Near the bottom of the supports these plates are covered by a plate so that the dais becomes a tank with this [last mentioned] plate as the floor of the tank. Then a balustrade, fretted and painted, is fitted around the upper part of the dais. On the floor of the dais, near its corners, four hollow brass columns about 1½ sp. high are erected. Above the columns is placed a brass castle, its long side four times as long as its short side, the same [length] as the dais, and about 1 sp. high. Above the castle, on its centre, is a small dome, having the same width as the castle. Around the upper perimeter of the castle is a fretted balustrade. What remains of the top of the castle at the sides of the dome is decked over, since the dome is in the centre of its upper surface.

Then two dark-complexioned shaykhs are made from joined copper, sitting cross-legged and facing each other along the dais. Each one holds in his hand, namely the right hand, a silver goblet with a highly filigreed lid. When water is poured [into it] it runs through its stem into the hollow hand and then into a jar with a siphon in it, as described [before]. The left hand grasps the neck of a bottle, the lower part of the neck being closed by a plate to prevent the water from running into the main section of the bottle. In the neck of the bottle is a hole in which is the end of a pipe. [The pipe] goes through the palm, forearm and elbow of the shaykh, is bent through into his body, is bent [again] beneath his skirt, and is inserted into the column on his left-hand side, from which [water] flows into it from above.

### Section 2

*Construction of the reservoir for the water, and its discharge into the bottle of one shaykh and the bottle of the other shaykh alternately*

A trough is made from copper, its sides 2 F high and the same area as the floor of the castle. A vertical plate is erected across the floor of the trough, dividing it into two halves. In each trough a [tipping]-bucket, as described previously, is erected, its capacity 20 *dirhams* of water. The back of each bucket is towards the plate which divides the trough into two. Then at the top of this plate in its centre two struts (*shazīya*) are fitted. One end of each strut is soldered to the plate and the other end projects a thumb's breadth above the plate. In it [i.e. the upper end of the strut] is a hole, so that an axle, yet to be mentioned, can rotate in the two holes. Between the two holes there is a gap. Then one takes a piece of channel, as light as possible, one fingerlength long. On its underside, in the centre, is a transverse [axle]. The ends of the axle are inserted in the holes in the two struts, and moves freely in them. The channel is then at right angles to the

<sup>1</sup> In Fig. 100 one holds the goblet in his right hand, the other holds it in his left – and vice versa for the bottles.

divided plate and its ends are directly above the rear ends of the two [tipping]-buckets. Of necessity one of its ends is tilted gently by its weight on to the near end of one of the buckets. When water drips into the channel it flows into this bucket which fills up. Its tip swings down and its rear end rises, lifting the end of the channel so that [water] which falls into the channel [now] drips into the other bucket. When this fills its tip swings down, its rear end rises and lifts the end of the channel which returns to its former position, and the water drips into the first bucket. And so on, as long as the water drips into the channel.

Then one makes a water reservoir for installing above the trough of the two buckets and the channel. It fills the castle and the dome and has a hole in its top<sup>2</sup> through which the water is poured. In its floor is a hole through which [the water] drips into a short pipe [then] into the

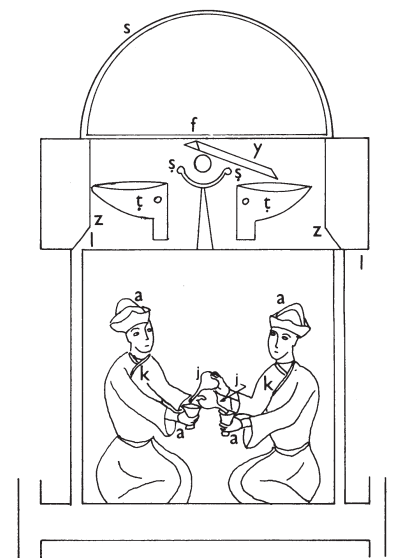
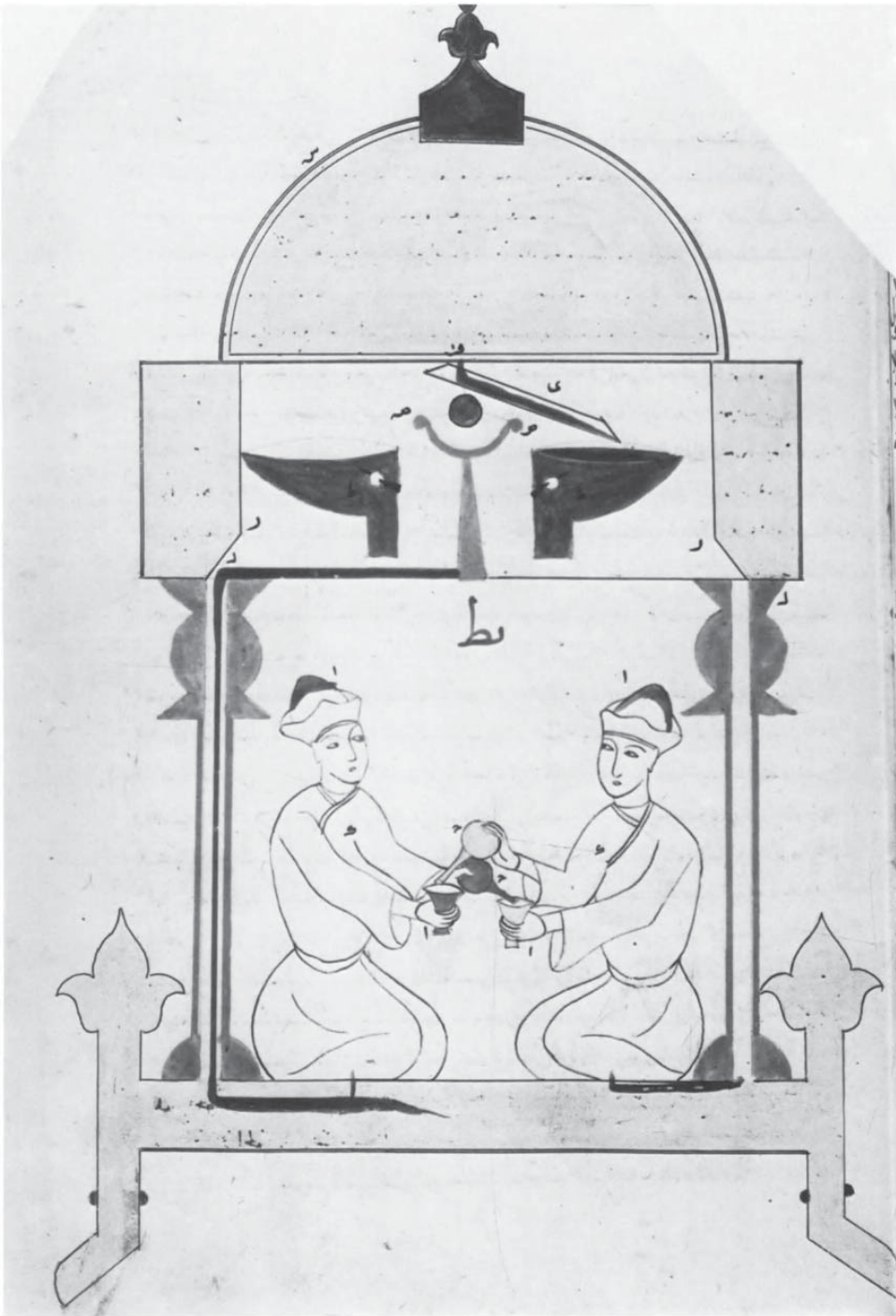


Fig. 100.

<sup>2</sup> Not clear. The hole may be in the dome.

<sup>3</sup> i.e. so that the water is directed into the channel.

channel so that the water does not run along the underside of the reservoir.<sup>3</sup> Then in the bottom of each of the two troughs a hole is made to which a pipe is fitted, the [other] end of which is connected to the vertical pipe in the adjacent column. The discharge into each trough thus flows into the end of the pipe connected to the neck of the bottle of each *shaykh*.

I have shown a picture of this: the platform, and the *shaykhs* with *a* on their heads and *a* on their hands; their elbows *k* which move on axles; the jars beneath their upper arms – no need to illustrate them since that was done previously; the bottles *jj* with the end of a pipe in the neck of each bottle; [the pipes] run from their hands to their elbows, then are bent down, emerge from beneath their skirts, [go] into the columns on their left-hand sides, then up to the tops *l* of the columns; two pipes *z* connected to the tops of the pipes in the columns and to the troughs *t* of the buckets; the plate dividing the two troughs with the struts *s* on it, the channel *y* which moves on the ends of its axle in the holes of the struts; the short pipe *f* from which the water drips into the channel from the underside of the reservoir; the reservoir *s*.

It is very clear that water is poured into the reservoir until it is full. It drips from the floor of the reservoir *s* into the channel *y* and runs through it into bucket *t*. [Then] it flows from its trough into pipe *z* and descends through the column's pipe to beneath the *shaykh*'s skirt and rises through the pipe in his arm only as far as the elbow. [This is] because the bucket discharges 20 *dirhams* and the downpipe and the rising pipe are filled by 20 *dirhams*, so nothing from the first bucket flows into the neck of the bottle. The end of the channel has tilted towards the other bucket and water flows in it until it is full. It discharges its contents into the pipe of the other channel, and the downpipe and the rising pipe are filled only as far as the elbow of the other *shaykh*. The channel tilts [back] to the first bucket into which water flows until it is full. It discharges and the water runs out and flows into the neck of the bottle [up] to its mouth, and flows into the goblet whose capacity is 20 *dirhams*. [Then] it flows from the stem of the goblet through the hand into the jar until it is almost full. It [i.e. the jar] sinks, the hand rises with the goblet until the rim of the goblet is between the *shaykh*'s lips, where it remains for a while. The contents of the jar discharge from the end of the siphon on to the floor of the dais, then run down through a hole into the tank, i.e. the dais. His hand sinks and the goblet leaves his lips. His head had been backwards and [now] recoils rapidly and nods several times. The construction of the head was described above in the chapter on the boon companion [Chapter 6]. Things proceed in like manner for the other *shaykh*, and they go on drinking in turns until the water in the reservoir is exhausted. The company breaks up, the dais is lifted and the water is poured out of a hole in the tank near one of the columns.

When it has been completed according to my description the dais, the columns, the castle, and the dome are scraped, and the two *shaykhs* are painted in various colours as previously. Everything that has been scraped and painted is coated with Sandarac oil.

This is what I wished to describe clearly.

[Now] I will describe what I made, namely a female cup-bearer.

## Chapter 10 of Category II

*It is a slave-girl who emerges from a cupboard at intervals, holding a glass which contains wine.  
It is divided into two sections*

### Section 1

*On its outside appearance and functioning*

It is a cupboard made of wood about 7 sp. high and  $2\frac{1}{2}$  sp. wide. It has a door with two closed leaves. This cupboard is by the king's side during carousals. It is of fine workmanship, and covered with variegated paintwork.<sup>1</sup> At the expiry of one eighth of an hour the leaves open on a slave girl standing in the door holding in her right hand a glass filled with wine and in her left a small towel (*mandīl*). The king takes the glass, drinks the wine it contains, puts the glass back in her hand and, if he wishes, wipes his mouth with the towel. Then he closes the [door] leaves on her. After an eighth of an hour the leaves open [again] and the slave girl emerges holding the glass. The king takes it, drinks, returns the glass to her hand and closes the leaves. This happens every one eighth of an hour.

I will describe the construction of the cupboard and the slave girl. A wooden cupboard is made of fine workmanship covered with variegated paintwork.<sup>2</sup> It has a door  $4\frac{1}{2}$  sp. high and  $2\frac{1}{2}$  sp. wide, which is raised slightly above the floor of the cupboard. Two brass leaves are made for it, which turn easily on their hinges. Then a hollow slave girl is made as light as possible from papier mâché, like a girl twenty years old. She stands on her feet. Then one takes a board 2 sp. long and as wide as the slave girl's foot is long. Then four rollers of cast-bronze are fitted at the corners of the board, in axles placed cross-wise in transverse slots at the corners of the board. When this board is placed on a flat surface which is inclined in one direction slightly, with its width in the direction of the slope, it will move rapidly on the rollers until stopped by something. The feet of the slave girl are placed across the board and secured to it. When the board with the slave girl on it is placed on a sloping surface with her face in the direction of the slope, the board and the slave-girl will move rapidly in the direction of the slope as long as they are not hindered by anything. Each of the rollers should be as I have described and of a width that can be encircled by the middle finger and thumb. At the centre they are a thumb's breadth thick, at the edge a barleycorn. This is the picture [Fig. 101] of the roller on its axle. Then two copper channels are placed on the floor of the cupboard, sloping gently from the back of the cupboard to its front, and are [then] made secure. When the slave-girl is lifted onto the floor of the cupboard with the rollers in the copper channels, she moves rapidly to the door of the cupboard and [then] stops.



Fig. 101.

### Section 2

*On the construction of the slave-girl's hand and its mechanism, the wine reservoir, the [tipping]-bucket and its trough*

A right hand is made for the slave-girl from copper, as light as possible, with the palm and fingers appearing as if she were grasping a wine glass. [One also makes] her forearm and elbow, with an axle in the elbow upon which it moves up and down. Its [i.e. the axle's] ends are fixed inside her sleeve. In her elbow is an extension which sticks out like a rod; its end penetrates her back through a slit which extends upwards, and protrudes about one fingerlength from her back. A short length at its end is bent down. Then the slave-girl is pushed to the back of the cupboard until her arm, i.e. the one which is extended and which holds the glass, is inside the cupboard. Cross-wise behind the slave-girl is an iron bar, its ends fixed to the sides of the cupboard, so that the bent down angle of the rod which extends from the slave-girl's elbow hooks on to the bar. This prevents the slave-girl from moving to the door of the cupboard because this bent-down end is heavier than the slave-girl's hand with the glass, when it [i.e. the glass] is empty. When a known [quantity] of water falls into the glass it becomes heavier than the end of the rod, and the angle

<sup>1</sup> *Nuqūsh*. This could also mean carved figures.

<sup>2</sup> See footnote 1.





lifts off the bar. The slave-girl runs rapidly on the rollers and opens the leaves with her left hand, which holds the towel. The left arm does not move and is longer than the right [arm]. When the left [door] leaf is pushed with the left hand, the right leaf opens first, because it is above the left one, and it does not touch the glass.

Then a copper reservoir is made, the same width as the top of the cupboard, and about 1 sp. high. Its interior is tinned. On top of it is a hole through which wine is poured into it. On this is a wide pipe, rising above the hole in the top of the reservoir, and on this is a shaped cover. Then beneath this reservoir a trough is installed, in which is a [tipping]-bucket whose construction has been described before. Its capacity is 100 *dirhams* of wine. In the floor of the reservoir a hole is made with a short pipe on it through which the wine drips into the bucket. A wide hole is made in the floor of the bucket's trough in which is a short pipe which is [vertically] over the board and hence pointing to the glass, when the slave-girl is inside the cupboard and prevented from emerging. I have shown the picture [Fig. 102] of the slave-girl *a* inside the cupboard and the board beneath her feet on the rollers, two rollers being visible; her hand, holding the glass, which moves about an axle *j* in her sleeve, the rod extending from a long slit in her back, its end *b* bent down, and held by a bar *d* across it; the bucket and the bucket's trough *e*, in which is a pipe *w* through which the wine flows into the glass, the reservoir *z* with a hole in its bottom upon which is a pipe from which the wine drips into the bucket, the wine is poured into the top *k* of the reservoir.

It is very clear that when the reservoir is filled with wine it drips into the bucket which fills in the space of one eighth of an hour and empties its contents into the bucket's trough, which discharges all at once into the glass in the slave-girl's hand. The glass becomes heavier, the angle of the rod lifts off the bar, and the slave-girl runs [down] and pushes the left leaf with her left hand, which is holding the towel. The leaves open without touching the glass. She stands at her post. The king takes the glass from her hand, drinks its contents, and if he wishes, wipes his mouth with the towel. Then he puts the glass in her hand, presses it down, and pushes the slave-girl gently until she shops. He lifts her hand up, and the bent end of the rod hooks over the bar. This is not visible to the company – the most they see is that he puts the glass in the slave-girl's hand and closes the leaves. This happens about every one eighth of an hour until the company breaks up.

That is what I wished to describe clearly.

[Now] I will describe what I made, namely a ewer from which is poured hot water, cold water and mixed [i.e. luke-warm water].

Fig. 102.

