

## The "Mathematical Table" in the Chinese Lodge of Palermo

Francesco Sorge

DICGIM, Polytechnic School, University of Palermo, Italy  
e-mail: francesco.sorge@unipa.it

**Abstract:** The end of the 18<sup>th</sup> century sees the decline of the late baroque and rococo in the decorative arts and the origin of the neoclassic essentiality. Nonetheless, the spirit of competition among the members of the European courts and of the aristocracy in erecting magnificent residences inside spectacular parks, full of astonishing pieces of furniture, is still alive and floods of money are spent without restraint. In this very period, a new curious type of dining table makes its appearance in the aristocratic dwelling houses and precisely in the hunting lodge of the Bourbon Court close to the city of Palermo in Sicily: the "Mathematical Table". This name is due to the fantasy of its designer, architect Venanzio Marvuglia, who probably wished to hint at the particular technical nature of the table. It was composed of a fixed frame and several movable parts, which were shifted up and down to the room beneath under the action of a proper lifting apparatus with ropes and pulleys. In this manner, the dining people could be served in a very private environment without the presence of the domestic staff. After this example, other "magic tables" were made during the 19<sup>th</sup> century.

**Keywords:** Movable table, hunting lodge, Palermo, Italy

### Introduction

The magnificence of the French *Grand Siècle* culminated with the construction of the royal palace of Versailles by Louis XIV, which became a model of the baroque splendor and sumptuousness and had to be imitated by all other reigning families of Europe, for example with the palaces of Caserta, by the King of Naples, of Sans-Souci at Postdam, by the King of Prussia, of Peterhof, by the Tsar of Russia.

The great-grandchild of Louis XIV, Louis XV, continued with this custom of pomp and ostentation which was intended to amaze the members of his court and the foreign guests. In the wake of Louis XIV, who had built the *Grand Trianon* at the border of the park of Versailles with the purpose of creating a quiet place for his privacy, he wanted to erect the *Petit Trianon* for his lovers, Madame de Pompadour first and, after her death, Madame du Barry.

Inside the *Petit Trianon*, the designer-artisan Loriot was given the task to create the two so-called *tables mouvantes* (or *volantes*) in order to surprise the King's guests. The plan of these tables envisaged the shifting up and down of some of their parts in order to lay the tableware and the meals in the "*fruiterie*" just beneath the dining room, so that the people participating in the banquet was not bothered by the presence of the menservants. Nevertheless, the tables and the masonry adjustment were judged too expensive and were never made, though the opening in the floor had been prepared. Gustave Desjardins says: *Avec sa table volante, le repas se sert et se dessert*

*tout seul et comme par enchantement. Au signal, le parquet s'ouvre: la table, toute dressée et chargée des mets, sort, accompagnée de quatre servants ou postillon également garnis. A chaque service, le milieu disparaît: il ne reste que le pourtour où sont les assiettes; une rose en métal, ménagée dans l'épaisseur du cercle, étend ses feuilles et cache le vide. La partie qui est descendue s'arrête au rez-de-chaussée ou on la couvre de nouveau. Le repas fini, table et postillons s'enfoncent dans le sol, les feuilles de parquet reprennent leur place et se rejoignent si exactement que il faut les avoir vu s'ouvrir pour croire qu'elles sont mobile (Le Petit Trianon, Versailles, 1885, page 34).*

It is interesting that many years later Marie Antoinette, wife of Louis XVI, ordered the installation of a similar mechanism, for the so-called "*glaces mouvantes*", under her *boudoir* in the *Petit Trianon*. A system of ropes and pulleys permitted the lifting of two great mirrors from the room below, in order to cover the two windows of the *boudoir* and ensure the privacy and the comfortableness of the Queen. This mirror system is still present and has been recently electrified.

Another moving table is to be recalled, prior to Marvuglia's table: the *table volante* in the castle Choisy-le-Roi near Paris, which was built by Architect Jacques Gabriel on order of Mademoiselle de Montpensier, cousin of Louis XIV. This table was raised all in one piece and completely dressed from the room below the dining room, similarly to other dining tables that were to be made in the late 19<sup>th</sup> century in Bavaria for King Ludwig the Second.

The burst of the French Revolution stopped this competition in creating astounding palaces and furniture in France, but the other European courts kept on with the past habits, insensitive to the occurring epochal changes.

### 1 The Court of Bourbon from Naples to Sicily

On January 11, 1799, the Napoleonic troops under the command of General Jean Étienne Championnet invaded the Kingdom of Naples, entering from the territories of the Roman Republic, whence Pope Pius the Sixth had been dethroned. At that time, King Ferdinand of Bourbon, the Fourth of Naples and the Third of Sicily (Fig. 1), had already hurried away towards Palermo in Sicily, sailing on December 21, 1798 by the English vessel Vanguard of Horatio Nelson, together with his wife Marie Caroline of Habsburg-Lorraine (Fig. 2). They took with them jewellery, works of art and a treasure of more than two millions



**Figure 1. King Ferdinand of Bourbon**



**Figure 2. Queen Marie Caroline of Habsburg-Lorraine**

ducats (nearly one hundred millions euro of today). Marie Caroline was sister of Marie Antoinette, the Queen of France who had been executed during the French Revolution in 1793, and strenuously opposed the new revolutionary ideas. She had been the real holder of the politic authority in the Kingdom of Naples until then, establishing a pro-Austrian course and giving her support to the Minister of Trade and Navy, John Acton, whereas King Ferdinand was mainly devoted to his several entertainments and to his favourite pastime: the hunt.

The royal couple was welcomed by the Sicilian aristocracy and it was not difficult for King Ferdinand to acquire several land holdings at the feet of Mount Pellegrino on the northern side of the city of Palermo. Though the noble Sicilian families Ajroldi, Salerno, Pietratagliata, Niscemi, Vannucci, Malvagna and Lombardo offered parts of their lands to the King, he preferred to buy them, with the purpose of realizing a royal hunting estate called "Real Tenuta della Favorita" (Royal Estate of the Favourite, i. e. the same name of his hunting site of Portici, near Naples), with an extension of nearly 400 hectares, which is still a great green lung near the gates of the city. The acquisition was supervised by Viceroy Giuseppe Riggio, Prince of Aci, who also arranged to grant parts of the holdings in emphyteusis, whose rent had to be paid to some creditors claiming their rights because of prior debts.

## **2 The Chinese Lodge of Palermo**

Just inside the land plot of Giuseppe Lombardo and Lucchese, Baron della Scala, there was a bizarre chalet in Oriental style with a partially wooden structure, the "Casina Cinese" (Chinese Cottage, Fig. 3), which he had inherited from his brother Benedetto, Judge of the High Civil and Criminal Court of the Kingdom of Sicily, and

was on sale for debts. Since that Chinese chalet had not yet been sold, it was transferred to the King in emphyteusis for the debt settlement.

The Chinese Cottage was well known in those days and was much appreciated by the King, so that he asked to the most renowned architect of that time in Palermo, Giuseppe Venanzio Marvuglia, to reorganize the building still maintaining the original style, which was quite in vogue in that period. Hence, the restoration work started and continued as long as the second sojourn of the royal family in Palermo, during two new French Kingdoms in Naples, of Giuseppe Bonaparte first and then of Joachim Murat (1805-1815). In fact, the Kingdom of Naples had been reconquered by the "sanfedisti" of Cardinal Ruffo in 1801, but had been lost again in 1806, after the second invasion of the French troops of General Andrea Massena. The completion of the work of the new Chinese Lodge took place also under the supervision of Marvuglia's son Alessandro. The final result was an architectonic jewel, rich in chinoiserie, frescoes, stuccoes, terraces and pagoda-like turrets, where all the Oriental decorative elements were interpreted from a neo-classic point of view (Fig. 4). Marvuglia followed the new trends of those times towards classicism, drawing also inspiration from his friendship with the French architect Léon Dufourny, who resided in Palermo four years during his "grand tour" throughout Italy in search of the Greek and Roman remains and designed the main pavilion of the Botanical Garden of Palermo.

Many artists of that time participated in the restoration of the lodge. The colouring of the external plastering, with a red and pale green decoration against an ochre background, is probably due to Raimondo Gioia, while the iron fencing, the pillars and the two detached turrets containing the "snail" stairs are by Giuseppe Patricola. A curious particular of the fencing are the little bells of



**Figure 3.** The Chinese Cottage in a contemporary watercolour by Pietro Martorana (from the collection of the Royal Palace of Normans, in Palermo). The painting dates back to some year between 1795, year of construction by Fuga of the Cathedral dome of Palermo, which appears in the far background, and 1798, when the Court came to Palermo.



**Figure 4.** The Chinese Lodge today, after Marvuglia's renovation: front and back prospects (on the left and right respectively).



**Figure 5.** The little bells on the fencing.

Oriental-style on the spikes, which pleasantly tinkle under the blowing of the wind (Fig. 5), so that the lodge had been named for this reason the *Villa delle Campanelle* (Bell Cottage) by the Marquis of Villabianca, who reported all the historical events occurring in Palermo in the course of

the 18<sup>th</sup> century in his *Diari della Città di Palermo* (Diaries of the City of Palermo). The front and back prospects of the house presented two pronaoi with six marble columns each, rising above galleries with gothic openings and supporting two pagoda-like roofings.

The interior is in three flats plus a basement.

Starting from the basement flat, it is possible to admire the ballroom and other halls, with frescoes of Velasco and Gioia (Fig. 6) and the King's bathroom with a large marble basin, which was probably located below the ground level to facilitate its filling with a large amount of water.

In the *rez-de-chaussée*, we find the audience hall (Fig. 7) and the King's apartment, with frescoes on the vaults by Velasco (Fig. 8). The dining room close by is decorated by rural scenes and contains the famous "Tavola Matematica" (Mathematical Table), which will be described in the following.



Figure 6. *Tromp-l'oeil* on the vault of the "Ruin Hall", by Raimondo Gioia.



Figure 7. The audience hall with frescoes on the vault by Rosario Silvestri and on the walls by Vincenzo Riolo.



Figure 8. Frescoes on the vault of the King's sleeping room by Giuseppe Velasco.

The second floor contains the Queen's apartment, where it is possible to find two sitting rooms, in Turkish and Pompeian styles respectively, a little *boudoir* with inlaid walls and the Queen's sleeping room, on whose walls we may observe the medallion-portraits of the members of the royal family. There was also the room of "Triscele" (from the ancient Greek τρισκελής = three-legged), which is the symbol of Trinacria, i. e. of Sicily (Fig. 9).

Standing in the space between the two terraces on the top of the lodge, we may see the "wind room", whose vault was decorated by Silvestri and is covered by a pagoda-like roof upon an octagonal dome which was originally destined to be an astronomic observatory (*specola*).

In the outside, the Chinese Lodge has an artistic Italian garden on its back and is surrounded on the eastern and northern sides by the park *La Favorita*.

In addition to this property, it must be recalled that King Ferdinand acquired several other "royal sites" in Sicily, at Boccadifalco, Calatafimi, Scopello, Partinico, and the royal hunting estate in the wood of Ficuzza, planned to gratify his huge love for the hunt.

### 3 The Mathematical Table

As mentioned previously, the dining room is in the mezzanine floor and has to be remembered for an original

piece of furniture that was named "Tavola Matematica" (Mathematical Table) by Marvuglia himself because of the ingenious mechanisms that equipped the table and were hidden under the dining plane. They were similar to the project of the *table mouvante* for the Petit Trianon of Versailles by Lorient, which was never realized, on the contrary (Fig. 10).

The kitchens were outside of the palace, in a *dépendance* which is nowadays the location of the Giuseppe Pitrè Ethnographic Museum, and the dishes were brought by the staff through an underground tunnel into the butler's pantry that was just underneath the dining room. Hence, they were raised to the dining room by means of an elaborate system of ropes, pulleys and counterweights, which permitted hoisting or lowering some parts of the table: a square larger portion in the middle and four circular parts facing the sides of the square. They had been cut out from the table itself with a great precision, so that the whole formed a unique plane when the moving parts were on the top of their run (see Fig. 11). In this manner, the King and his guests were free to discuss of any subject, even the most delicate or awkward, without the presence of the domestic staff in the dining room.

Figure 12 shows an overall view of the hoisting systems in the room underneath the Mathematical Table. They were constructed by the carpenter Rocco Zappulla



Triskelion

Figure 9. The room of "Triscele", a woman head, originally of the Gorgon Medusa, with three legs, which is represented in the fourth medallion from the corner and is the symbol of Sicily (see particular). Copyright: [www.palermointorni.blogspot.com](http://www.palermointorni.blogspot.com).



Fig. 10. The "Mathematical Table".

and the glassworker Ignazio Figlia, according roughly to the plans of the *table mouvante* of the *Petit Trainon* by Lorient, which were available to the King, maybe through his sister-in-law Marie Antoinette of France. The total cost of the handiwork was of 86 Sicilian *onze* (ounces), 10 *tari* and 12 *grana* (1 ounce = 3 ducats = 30 *tari*, 1 *tari* = 20

*grana*), which is approximately equivalent to 14000 euro of today. The certification by notary Cavarretta of the quittance of the first payment of 60 ounces, issued by Rocco Zappulla to the Prince of Aci says: *Faccio fede io infrascritto notaro don Gioacchino Cristoforo Cavarretta qualmente agli atti miei sotto detto giorno appare apoca*



**Figure 11. Detail of the moving parts of the table: one central square portion of the table and four circular discs.**



**Figure 13. "Tischlein-deck-dich!" at Linderhof.**

per la quale mastro Rocco Zappulla falegname confessa dall'illustrissimo don Giuseppe Riggio principe di Aci delegato di Sua Maestà, Dio Guardi, nostro Sovrano onze sessanta. Sono a conto di attratti e mastria della tavola a mangiare che deve salire e scendere giusta il modello fatto venire da Napoli da situarsi alla Casina di S. M. Reale esistente nella contrada de' Colli come per detta apoca alla quale ... Actis notarii de Cavarretta de Panormo qui supra de premissis fidem facio. Collazione salva (I, the undersigned, notary G. C. Cavarretta, certify that on this same day (March 17, 1800), I see the quittance of sixty onze by master Rocco Zappulla, carpenter, to the most illustrious don Giuseppe Riggio, Prince of Aci, delegated by His Majesty Our Sovereign, God Save. They are in partial payment of materials and craftsmanship for the dining table to be located in the Lodge of His Royal Majesty existing in the land of Colli ... From the deeds of myself, notary Cavarretta of Palermo, I vouch the statement written above. Conform to the original). The quittance of the full payment, on date September 5, 1800, was certified by notary Cavarretta with a quite similar formulation and was issued by Ignazio Figlia for the remaining amount of 26 onze, 10 tarì and 12 grana: Faccio fede io infrascritto notaro don Domenico Giachino Cavarretta Sarcì qualmente agli atti miei sotto l'infrascritta giornata appare apoca per la quale mastro Ignazio Figlia vetraio confessa dall'eccellentissimo don Giuseppe Riggio principe di Aci come delegato di Sua Reale Maestà nostro Sovrano, Dio Guardi, la somma di onze ventisei tarì dieci e grana dodici e sono a compimento



**Figure 12. The lifting apparatus of the table.**

di onze ottantasei tarì 10,12 comprese onze sessanta pagabili per apoca agli atti miei sotto li 8 Aprile 1800, alla quale ecc. sono per saldo, resto, e compimento di diverse opere dal detto Figlia eseguite, e fatte eseguire da diversi artefici d'ordine di don Giuseppe Venanzio Marvuglia per la Tavola Matematica, che sale, e scende nella Real Casina de' Colli come a detta apoca Idem Notarius de Cavarretta Sarcì Panormi qui supra de predictis scripturis fidem facio. Collazione salva. (I, the undersigned, notary don D. G. Cavarretta Sarcì, certify that on this same day I see the quittance by master Ignazio Figlia, glassworker, to the most excellent don Giuseppe Riggio, Prince of Aci, delegated by His Majesty Our Sovereign, God Save, for the amount of twenty-six onze, ten tarì and 12 grana, and they are in settlement of various works of the said Figlia, executed or got them executed by various craftsmen by order of don G. V. Marvuglia for the mathematical Table that goes up and down in the Royal Lodge of Colli ... From the deeds of myself, notary Cavarretta Sarcì of Palermo, I vouch the statement written above. Conform to the original).

The Mathematical Table is an example in a class of its own in this kind of furniture, with no further imitation in the following years. Only in the second half of the 19<sup>th</sup> century, other types of moving tables were constructed in some residences of the reigning families. Here, we recall the "magic" tables *Tischlein-deck-dich!* (Little Table, set yourself!) present in two castles of Ludwig the Second of Wittelsbach, King of Bavaria, i. e. at Herrenchiemsee and Linderhof (Fig. 13), together with many other oddities, as for example the artificial grotto of Venus and its swan-shaped boat, which were illuminated with changing colours by using nearly twenty dynamos. Anyway, their mechanics was simpler and differed by the Mathematical Table of Palermo because they were raised wholly dressed from the room below.



**Figure 14. Sliding central frame of the table.**  
The central rope may be drawn from below, through a couple of underground pulleys, by a monkey winch on the side of the scaffolding. Four ropes are fixed at the corners and permit to lift the frame from below by means of eight upper pulleys which return the ropes downward.



**Figure 15. One of the four traction ropes on the corner for the lifting of the central frame.** On its side, another rope carries one of the four leaden counterweights that were hung to facilitate the frame hoisting.



**Figure 16. Path of the traction rope for the central table descent, underground from the centre of the scaffolding to the winch of Fig. 17.**

#### 4 The mechanisms of the Mathematical Table

Figures 14 to 19 show details of the lifting apparatus of the Mathematical Table.

The central square plate is at the top of a frame formed by straight boards arranged along the edges of a prismatic structure. This frame is capable of a sliding motion up and down along the vertical direction (Fig. 14). The hoisting motion is operated from downside by the reverse pull of four ropes, wound presumably on eight pulleys mounted on the fixed upper frame. Moreover, it is facilitated by four leaden counterweights suspended by a rope system similar to the lifting system (Fig. 15). On the contrary, the downward motion is operated by a direct pull through a monkey winch, to whose winding drum the rope arrives starting from the table centre and wrapping on two underground pulleys (Figs. 16 and 17).

On the four sides of the central square structure, there are the rails of the hoisting systems for the four side discs of the table. Each disc is mounted on the top of a mast with a square cross-section, capable of a telescopic motion in



**Figure 17. The monkey winch for lowering the central square plate of the Mathematical Table.** On its back, it is possible to catch sight of the underground passage joining the cuisine to the butler's pantry just underneath the dining room.

the vertical direction. This motion results from the relative motion with respect to a rectangular frame, which slides in turn along grooves gouged in the fixed scaffolding (see Fig. 18, Fig. 12 and upper left corner of Fig. 15). This arrangement is certainly due to the need of raising the disc by the use of a mast with limited transverse sizes through the small space between the central square structure and the circular hollow cavity bored in the floor of the dining room. As the mast has a certain length and slides along two square vertical sleeves, as is observable in the figure, also



**Figure 18. The masts carrying the four rising discs of the table can slide with respect to rectangular frames sliding along vertical rails gouged in the fixed scaffolding (see also Fig. 12 and upper left corner of Fig. 15).**

the frame carrying these sleeves must slide, in order to enable the descent of the top disc to a level that is low enough to be loaded or unloaded by the menservants with the food supplies. Four holes on the floor of the lower room permit the mast sinking to a sufficient depth in order to allow the staff to work on its top disc.

The request for the desired dish or beverage was made from upside by means of suitable spring bells, which were operated drawing the one or the other of a series of silk strings with different colours (see Fig. 19). The release of the springs caused the outward snaps of various horizontal rods, for the communication of the expected supplies or for the order of clearing away the dishes. On date December 6, 1800, the amount of 25 *tari* and 10 *grana* (nearly 130 euro) was paid to the merchant don Angelo Crocini for these silk strings.

The schemes of the central lifting mechanism and of the four side frames raising the masts with the discs are shown in the two Figures 20 and 21, where their operation is clearly and simply elucidated. The ropes are in part located inside suitable grooves gouged in the various structural elements and in part outside. They pass from the inside to the outside of the fixed structure through holes drilled in it. All the movable components slide along vertical tracks whose slipperiness was probably granted by some form of greasing or waxing.

Figure 20 clearly illustrates the raising of the central square frame, i. e. by the downward pull of the four side ropes with the aid of the leaden counterweights mounted in parallel, whereas the descent is carried out by the use of the winch located nearby. The traction rope passes under the floor. A large square hole is dug in the basement of the wooden framework, with the purpose of housing the moving square frame and letting its top plate descend to the right level to fulfil all service tasks.

As observable in Fig. 21, the four masts carrying the



**Figure 19. (a) Coloured strings used to order the desired dish or beverage. (b) Tinkling device operated by the string command.**

**Each rod snapped with a clink outwards from the lower box, under the draught of one of the upper strings, accompanied by the simultaneous release of a catch spring.**

circular discs may be raised by traction ropes, some of them acting on the carrying frame and the others on the masts themselves in their relative sliding with respect to the moving frames. On the other hand, the masts are lowered by releasing them under the action of gravity and making also use of other auxiliary ropes pulling downward directly.

Notice also, in Figs. 20 and 21, that the connection of the ropes with the sliding frames is in their lowest points, to enable their rising to the highest possible level.

Summing up, even though the lifting apparatus of the Mathematical Table cannot be regarded as a masterpiece of elaborated engineering, yet it certainly reveals the ingeniousness and the skill of the designers and the workers of the early 19<sup>th</sup> century in the carpentry manufacturing.

### 3 Conclusions

- (1) During two short periods of staying in Sicily of the Bourbon Court of Naples, which was pushed away by the French revolutionary armies, some pleasant sites were acquired by the royal family to continue their usual life despite the historical events of those times. A quaint hunting lodge in a mixed Chinese-neoclassical style was restored in the proximity of the city of Palermo as a sort of toy house for the delight of the King and the Queen and of few selected guests.
- (2) The dining room of this residence lodge has to be remembered for a strange piece of furniture devised by



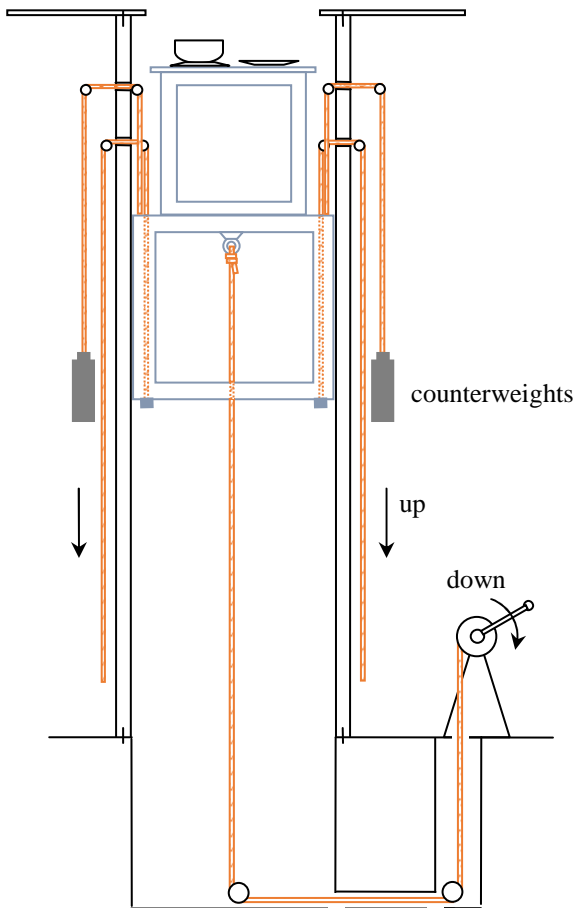


Figure 20. Scheme of the lifting and lowering systems for the central square frame, by ropes drawn from below the former and by monkey winch the latter.

Architect Giuseppe Venanzio Marvuglia: the *Tavola matematica*, a mechanical table where parts of the top board are cut out and mounted on moving frames and masts operated from below that permitted the raising and the descent of the food and the tableware, and left the dining people undisturbed by the presence of the menservants. This sort of "domestic wonder" was inspired by some previous examples handcrafted for the palaces of the European courts and the aristocracy, but was unique in its singular conception, of a system with partly movable elements, and was never repeated in this elaborated form in the course of the 19<sup>th</sup> century.

#### Acknowledgements

The service *Soprintendenza per i Beni Culturali e Ambientali di Palermo, Regione Sicilia*, the Superintendent Dr. Maria Elena Volpes and Architect Giuseppe Dragotta are gratefully acknowledged for the assistance in collecting the documentation.

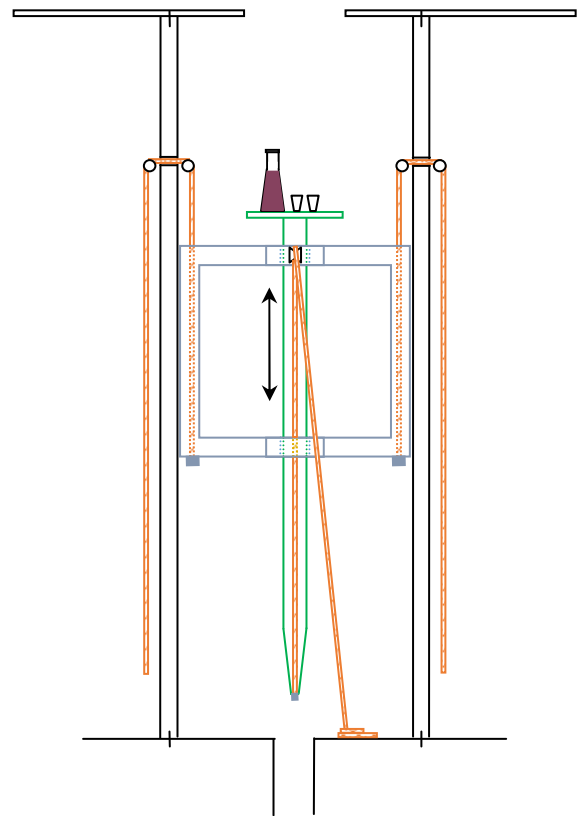


Figure 21. Scheme of the telescopic lifting system for each of the four side discs, by ropes drawn from below. Descent by gravity and/or by other ropes in the inside of the square framework.

#### References

1. Francesco Maria Emanuele Gaetani di Villabianca, *Diari della Città di Palermo* (Diaries of the City of Palermo), Biblioteca Comunale di Palermo, 1743-1802.
2. Léon Dufourny, *Diario di un Giacobino a Palermo* (Diary of a Jacobin in Palermo), edited by Geneviève Bautier-Bresc and translated by Raimondo A. Cannizzo in 1991, Fondazione Culturale Lauro Chiazzese della Sicilcassa, Palermo, 1789-1793.
3. Gustave Desjardins, *Le Petit-Trianon: Histoire et Description*, Nabu Press, paperback, 2013.
4. Romualdo Giuffrida and Maria Giuffrè, *La Palazzina Cinese e il Museo Pitrè nel Parco della Favorita a Palermo* (The Little Chinese Palace and the Pitrè Museum in the Park of the Favourite in Palermo), Giada Editions, Palermo, 1987.
5. Monica Ruffini, *Casina alla Cinese in Palermo, Diletto e Meraviglia* (Chinese Lodge in Palermo, Delight and Wonder), published by *Soprintendenza per i Beni Culturali e Ambientali di Palermo, Regione Sicilia*, 2008.