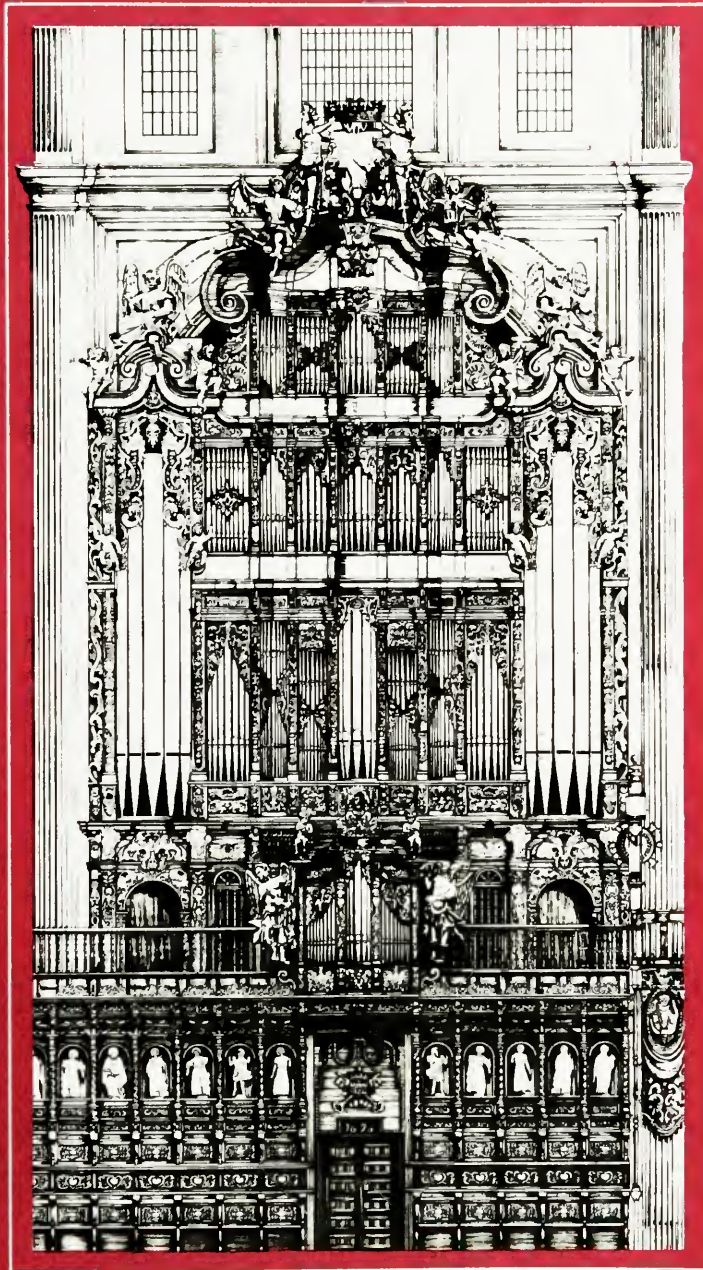


THE RGANS OF MEXICO CITY CATHEDRAL



DIRK ANDRIES FLENTROP translated by *JOHN FESPERMAN*

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Robert McC. Adams
Secretary
Smithsonian Institution

The Organs of Mexico City Cathedral

Dirk Andries Flentrop

John Fesperman, translator



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ABSTRACT

Dirk Andries Flentrop (John Fesperman, translator). *The Organs of Mexico City Cathedral*. *Smithsonian Studies in History and Technology*, number 47, 53 pages, 28 figures, appendix.—Published as part of *Visitatio Organorum*, a tribute to Dr. Maarten Vente, *The Organs of Mexico City Cathedral* gives a description of the two cathedral organs based on information gathered during their restoration under the author's direction.

A brief description of the first cathedral organ, made in Spain by Jorge de Sesma and set up in the Cathedral by Tiburcio Sans in 1693, is followed by a detailed account of the two existing organs, their musical resources, and their restoration. Both instruments were probably made in Mexico by José Nassarre, a Spanish builder, and both were completed in 1735–1736. They are the largest eighteenth-century organs in the Americas and constitute a splendid monument to Spanish culture in the New World. It is likely that some parts of an earlier organ were incorporated into one or both of the present instruments, and Flentrop notes the problems of dating them precisely.

The restoration, begun in 1975 and completed in 1978, is described in detail; changes found to have been made in the original instruments are noted. Pipe scales and dispositions for both organs are given, along with other technical information about their design and construction.

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Preface

Restoration has always been a prime concern of the organ builder D.A. Flentrop, and the restoration of the two great organs of Mexico City Cathedral represents the crowning accomplishment of his career as *Directeur* of the Flentrop Orgelbouw. But for his dedicated efforts, based on long experience with early instruments in both northern European and Iberian styles, these monumental organs might well have been drastically altered or lost forever. After decades of neglect, both organs were so damaged by fire in 1967 that their survival was problematic.

Dr. Flentrop's description of the state of the organs in 1975, what is known of their early history, and the work done to restore them, was originally published in the *Festschrift* honoring the Dutch historian, Dr. Maarten Vente, on his sixty-fifth birthday. Flentrop's tribute to Dr. Vente is therefore included in this English edition (see page v). This translation was made from Dr. Flentrop's manuscript; it corresponds to the published Dutch version, with occasional editorial changes. The notes have been gathered into a separate section; the translator's additions and annotations are in the form of initialed (J.F.) notes. Photos not otherwise credited were taken by D.A. Flentrop.

Publication by the Smithsonian Press was made possible with the kind permission of the Dutch publisher, Frits Knuf of Amsterdam, and Dr. Flentrop, who also reviewed the translation. The enormity of the restoration problems in Mexico City Cathedral and the meticulous care with which they were solved constitute a special tribute to Dr. Flentrop. His description of the work will both instruct and encourage lovers of the organ and its music.

John T. Fesperman, Curator
Division of Musical Instruments
Smithsonian Institution
July, 1980

Dedication

Dr. M.A. Vente's Ph.D. dissertation, presented to the University of Utrecht in 1942, for his degree was entitled "Foundations for a History of the Dutch Organ in the Sixteenth Century." Our acquaintance dates from the years when he was preparing this work. Our mutual concern for the historical organ was not limited to the Netherlands. After several exploratory investigations by Maarten Vente into the then unknown area of early Spanish organs, we went, together with several other interested people, to Spain in order to study several of the most important historic organs. Later, another trip was made in order to make detailed measurements and to study the construction and sound characteristics of the Spanish horizontal reed stops or "Chamade registers." The study and measurement of these, of which so little was then known by Dutch organ builders, served as the basis for making the Chamade registers in the organ for the Rotterdam Concert Hall, "De Doelen."

On other trips by Maarten Vente, contacts were made with the Gulbenkian Foundation in Lisbon. These contacts led to our working together on the restoration of several historic organs in Portugal. It was the information and experience gained here that caused Mexican authorities to engage me for the restoration of the organs in the Cathedral of Mexico City.

Just as Maarten Vente's dissertation brought together basic information for the history of the Dutch organ, so this documentation of two organs, from the beginning of the Iberian organ culture in Mexico, attempts to assemble foundations for the rich history of Latin-American organ-building. These are only building stones, without any pretence at completeness, except for the inclusion of pipe scales. What follows is a summary description of these fascinating and hitherto almost unknown Spanish organs.

The deep concern of Maarten Vente for Iberian organ culture richly deserves this contribution to the *Festschrift* honoring his sixty-fifth birthday.

D.A. Flentrop

The Organs of Mexico City Cathedral

Dirk Andries Flentrop
John Fesperman, translator

Important Points in the History of Mexico City Cathedral

- 1521 On August 13 of this year, the Spanish conquerors arrive in Mexico City.
- 1524 Cortez oversees construction of the first Christian church in Mexico City.
- 1528 Pope Clement VII elevates this church to the rank of cathedral. In the same year, the newly named Bishop, Juan de Zumárrage plans the building of a new cathedral.
- 1573 Work on the foundations was begun in 1528, but it is not until 1573 that the first stone of the new cathedral is actually laid.
- 1615 King Philip III approves the plan for building the cathedral.
- 1655 On February 2, the first consecration of the incomplete building is held.
- 1667 With the completion of the interior, a second consecration of the cathedral is held on December 22.

Notes on the History of the Organs of Mexico City Cathedral

According to Jesús Estrada (1973:38–42), an organ, built in 1693 by Jorge de Sesma, was ordered for the cathedral in Mexico City. Tiburcio Sans installed it in the cathedral as the first Epistle organ. The organ's facade and the choir

seats were designed by Juan de Rojas. The organ, put into use on April 15, 1695, had the following disposition.

Disposition of the Epistle Organ

Registros bajos

Registros altos

SEGUNDO TECLADO

Do. . . do (25 notas)	Do sostenido. . . re (25 notas) ¹
flautado de 26	flautado de 26
flautado mayor	flautado mayor
flautado nave	flautado nave
violón	violón
octava clara	octava clara
octava nazarda	octava nazarda
fabiolete	flauta traversa
espigueta	espigueta
docena clara	docena clara
docena nazarda	docena nazarda
quincena clara	quincena clara
quincena nazarda	quincena nazarda
diez y setena clara	diez y setena clara
diez y setena nazarda	diez y setena nazarda
diez y novena clara	diez y novena clara
veinte docena clara	corneta magna
corneta de eco	corneta de eco
lleno	lleno
simbala	simbala
sobre simbala	sobre simbala
	tolosana
chirimía nave	trompeta magna
bajoncillo	clarín claro
trompeta real	clarín claro
bajoncillo	clarín claro
clarín en quincena	trompeta magna
orlo	chirimía
clarin en quincena	obue
	obue
	trompa real
	clarín claro

John Fesperman (translator), Division of Musical Instruments, National Museum of American History, Smithsonian Institution, Washington, 20560.

ORGANO CADERETA: PRIMER TECLADO

octava clara	flautado mayor
docena clara	octava clara
diez y setena	docena clara
diez y novena	tolosana
lleno	corneta de ecos
violón	lleno
	violón

ORGANO POSITIVO: PRIMER TECLADO (de espalda)

octava clara	fabiolete
quincena clara	quincena clara
veinte docena	diez y setena clara
	corneta magna

The history of the Gospel organ (Estrada, 1973:42-47) is of special interest, because it was made entirely in New Spain. It was built by José Nassarre, after he had rebuilt the Epistle organ. The enlarging of the Cadereta² was completed on May 5, 1734. Nassarre undertook to build the other (Gospel) organ himself: it was to have 79 registers and cost 30,000 pesos. It was to be constructed like the Epistle organ. Three organists were mentioned. In October 1735 the rebuilding of the first organ and the construction of the new organ were completed.

Disposition of the Gospel Organ

*Registros bajos**Registros altos*

SEGUNDO TECLADO

Do, re, . .do (24 notas) ³	Do, . .re (26 notas)
flautado en 26	flautado en 26
flautado mayor	flautado mayor
flautado nave	flautado nave
violón	violón
octava clara	octava clara
octava nazarda	octava nazarda
espigueta	espigueta
docena nazarda	docena nazarda
docena clara	docena clara
espigueta	flauta transversa
quincena clara	quincena clara
quincena nazarda	quincena nazarda
	diez y setena clara
diez y setena nazarda	diez y setena nazarda
diez y novena clara	diez y novena clara
veinte docena clara	rochela
veinte docena nazarda	corneta magna
	corneta de ecos

lleno
simbala
sobre simbala

orlo
trompeta real
bajoncillo
bajoncillo
clarín de quincena
orlo
chirimía

lleno
simbala
sobre simbala
tolosana
trompeta magna
trompeta magna
trompeta real
clarín claro
clarín claro
clarín claro
obue
chirimía

ORGANO CADERETA: PRIMER TECLADO

trompeta	trompeta
violón	violón
octava clara	octava nazarda
veinte docena	docena clara
diez y setena	diez y setena clara
diez y novena	tolosana
lleno	lleno

POSITIVO DE ESPALDA (PRIMER TECLADO)

octava clara	octava clara
quincena clara	quincena clara
veinte docena clara	diez y novena
	corneta magna

RECITATIVO (EN CAJA DE EXPRESIÓN)

Teclado de do, . .re (27 notas)	violines
	chirimía
	violón
	docena clara
	quincena clara
	diez y novena clara ⁴

Manuel Toussaint's book, *La Catedral de México* (1948:113), provides further useful information.

The organs, located in the *Coro* (choir) between two great arches of the nave, can also be seen from the side aisles. The structure is baroque, with important French influences. Ornamentation is executed in the *rocaille* style. They date from the eighteenth century and were completed in 1736.

Later, Toussaint (1948) gives the following information from the *Gazeta de México* for October 23, 1736.

Handsomely designed cases of beautiful wood, 17 varas⁵ high and 11 varas wide . . . bellows placed high in the case. Three thousand, three

hundred and fifty pipes, with a list of register names.⁶

In Toussaint (1948:286) an interesting letter from Tiburcio Sans to officials in Spain is quoted; a summary follows. At the order of the King, an organ was made for the cathedral of Mexico City. The organ case was made for four thousand pesos. The organ has been set up. In addition, the following were made: two bellows, wind-chests and a Registro de Contrás, and four hundred extra pipes to fill the facade. The organ was given the pitch directed by the musicians. Changes in the original plan were made as re-

quired for the addition of the "Contrás." Because of these changes, a higher remuneration than the eight thousand pesos, for the setting up of the organ itself, is requested.

From this letter it appears that although the main parts of the organ were made in Spain, important subsidiary parts were made by Tiburcio Sans in Mexico.

In addition to the scanty evidence drawn from the above-mentioned articles, the inscriptions below were found in the main windchest of the Gospel organ during the restoration, which was accomplished between 1975 and 1978.

D.º Joseph Nassarre fecit año 1735 siendo Ar[s.]
S.º D.º Juan Ant.º de Vizarron y Eguiarreta = y []
Jss.º Cavildo los S.ºs D.ºs Alóso Moren[]
ga y D.º D.º Joseph Codallos y Rabal. = Patr[]

D.ºn José Perez de Lara, hizo los Reparos que nesecita^{da} este^{on} Orga-
no en el año de 1817. Siendo Arsobispo el Señor Don Pedro dela Fonte
[] substituto de chantre el S.º D.º Villaurrutia, quien sué el comi para este
[fin].

Inscription A confirms Estrada's (1973:47) assertion that the construction of the new (Gospel) organ was finished in October 1735.

Inscription B shows that the same organ was restored in 1817 by José Perez de Lara, sadly without any information about what that restoration entailed.

Nothing further about the history of the organs is known, except that they were damaged by fire in 1967. Due to the fire, nearly all the front pipes and most of the resonators for the Chamade reed stops were lost. The "Positivo de Espalda" of the Epistle organ was seriously damaged and the windchest, with all the pipework standing on it, was completely destroyed. In both organs, the ornamental carving in the facades on the choir side was badly burned in various places.

Dating the Cathedral Organs

According to Estrada (1973), the Epistle organ was put into use in 1695 and the Gospel organ was completed by 1736. The latter date is confirmed by the inscription in the main windchest to the effect that this organ was made by Joseph Nassarre in 1735.

An inspection of the instruments supports the assumption that the Gospel organ is the older of the two. On both keyboards it lacks great C#. The Epistle organ has a complete great octave, an indication that it was built at a later time.

From the manner of construction of the two organs, it is certainly not clear which is older. Because of the similarity of the two, the first suspicion is that *both* were made in 1735–1736. In that case, it is not unlikely that Joseph Nassarre used various pipes and perhaps rebuilt parts from the 1695 Epistle organ in the two new organs.

A careful historical investigation might clarify both the dating and the history of these instruments. It would be very interesting to see where such a project would lead.

Restoration

The restoration of the organs was undertaken in 1975–1978, under the authority of the Direc-

ción General de Obras en Sitios y Monumentos del Patrimonio Cultural.

Architect Jaime Ortiz Lajous, director of the above-named department, provided the vigorous leadership that made the work possible, despite many formidable obstacles. His colleagues, the architects Louis Caetano, Michael Drewes, and Francisco Ursus Cocke, should also be mentioned here. The Smithsonian Institution must also be acknowledged. In 1973 David Hinshaw provided a detailed description of the reed stops. John Fesperman and Scott Odell, concerned with the preservation of historical instruments at the Smithsonian, also contributed to the restoration.

The restoration was done by the Flentrop Orgelbouw B.V., based on the same principles as those applied in the Netherlands by the state consultant for organs.

The old pipes, windchests, bellows, and other components were conserved with the greatest possible care in their original state. The parts damaged by the fire were restored to their original state. Pipes and other items destroyed by the fire were replaced, but in the "old" way, using the same materials and construction techniques originally employed. Pipes and parts that had disappeared over the course of the years were made new, based on existing parts and evidence within the organs. The carving was restored by Mexican woodworkers under the direction of the office of Patrimonio. Further restoration of the carving and replacement of decorations for the new front pipes will also be financed by the office of Patrimonio.

It is clear that in both organs, a number of changes were made in the past, for which, up to now, no documentation whatever has been found. Existing pipe holes in topboards indicate alterations, as shown below.

Gospel Organ	
Main Division	
Simbala (III bass)	original IV rank register
Sobre Simbala (II bass)	original III rank register
Simbala (II treble)	original III rank register

Sobre Simbala (III treble)	original IV rank register
Cadereta Exterior	
Veinte y Docena Clara (bass)	original III rank register
Cadereta Interior	
Lleno (III bass)	original IV rank register
Lleno (III treble)	original V rank register
Open space, bass and treble	original reed register
"Solo"	
Docena Clara	original II rank register
Epistle Organ	
Main Division	
Simbala (II)	original single rank register
Sobre Simbala (III bass)	original single rank register
Simbala (III treble)	original IV rank register
Sobre Simbala (II treble)	original III rank register

For the last two registers, the apparently original piperacks are for III and II rank registers respectively, so rackboards and holes in the topboard do not agree.

The resonators for the Chamade register Bajoncillo have been replaced with longer ones. It is not impossible that larger reeds and shallots were put in at the same time. The pitch is low, lying between F and G (16') in place of the original C at 4' pitch. It appears that the Clarin Claro 8' and the Obue 4' were originally 4' and 2' registers, respectively.

The apparent changes in the disposition were not restored, because there is not yet enough certainty as to the original condition of the instrument.

Some Characteristic Features of Construction

The lowest front section of the main organ case consists of pipes of the Flautado Mayor 8' of the main division. At the left and right sides are the pipes from the Flautado 16' of the Pedal. The two front sections above these consist completely of pipes which do *not* speak.

The measurements of the main case are: depth, 280 cm; width, 900 cm; and height, 1500

cm. The measurements of the Cadereta case are: depth, 52 cm; width, 210 cm; and height, 245 cm.

The keyboards from both organs have a range of C–d^{'''}. In the Gospel organ, C# is omitted on both keyboards. At the right side of the keyboard for the main division of the Gospel organ, there is a third keyboard for the "Solo," with a range of c'–d^{'''} (see Figures 18, and 19). The pedal register has a range of C, D, E–B (see Figure 23). Additionally, at the left side of the main division keyboard there are 10 extra keys, which are directly connected to the pedal windchest. The pedal registers can therefore be played with either pedal keys or manual keys (see Figures 18, 19).

The design and measurements of the windchests made it feasible to use a very simple action, which travels a very short distance. The large pipes are placed off the main chests, fed by wind conductors, thus making it possible to have chests of minimal length in the main division. The short length of the chest makes it possible to have very short trackers, which are practically friction free. The main division chests are located directly above the keyboards, allowing the various turning points of the action to be kept to a minimum. Also, the Cadereta pallet box, located directly under the keyboards, requires a minimum of turning points for its action. From this separate pallet box, the wind goes through wooden conductors to the interior and exterior windchests of the Cadereta (see Figures 22, 24, and 26).

From the way in which the windchests are made and the manner in which the action is connected, it is clear that in both organs a responsive and light touch was intended.

The windchests, all in chromatic arrangement, are made from massive pieces of solid wood, with channels carved in the wood itself. This is in contrast to the normal frame construction, with separate pieces glued in between the channels (see Figure 21).

The Gospel organ has six bellows, placed above the organ. They are V-shaped and have six folds per bellows (see Figures 26, 27). They can be raised using ropes.

The two very large V-shaped reservoir bellows, with eight folds per bellows (see Figure 20) in the top part of the Gospel organ, are winded from the top and bottom sides, each being fitted with two folds. These “two times two” bellows are set in motion by only one lever. Thanks to the remarkable balancing of the bellows, this lever can be managed by only one man.

The front pipes are made of an alloy of 40% tin and 60% lead. The interior pipework consists

of 20% tin and 80% lead. No inscriptions or pitch indications were found on any of the pipes. The wooden pipes are made of pine.

At a temperature of 20° Celsius the pitch of both organs is a half step lower than $A = 440$. Both organs are tuned according to Chaumont temperament. Both pitch and temperament are in accord with the original length of the pipes. Wind pressure of the Gospel organ is 95 mm, and of the Epistle organ is 75 mm.

APPENDIX

Gospel Organ Pipe Scales

Organo Principal, Bass Registers

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Flautado de 26	Prestant 16'					
ø		280×230	235×185	152×128	110×100	77×63
mouth width		230	185	128	100	63
cut-up		75	58	42	34	24
Flautado Mayor	Prestant 8'					
ø	choir side	167	137	95	82	51
mouth width		121.9	100	69.4	59.9	37.2
cut-up		35	29	20.3	17.5	11
Flautado Mayor	Prestant 8'					
ø	nave side	157.3	137.3	92.7	76.2	52
mouth width		114.9	100.3	67.7	55.6	38
cut-up		34.5	27.8	20	16.2	11.2
Violon	Gedekt 8'					
ø		117×94	103.9	73.9	58.6	44.6
mouth width		93	78.5	55.8	44.8	33
cut-up		32	30.2	24	21.1	12.9
Octava Clara	Octaaf 4'					
ø		88.7	71.4	46.8	37.9	27.1
mouth width		64.6	49.5	34.5	26	20
cut-up		21	18.8	12	10	7.4
Octava Nasarda	Open Fluit 4'					
ø		127	100	70	61.1	45.2
mouth width		87.5	66.4	48.8	40.8	30
cut-up		21	21	15.5	13.6	10.7
Espigueta	Roerfluit 4'					
ø		104.5	83.1	55.7	45.5	33.4
mouth width		74.5	58	38.8	32.3	25
cut-up		22	20.7	17.4	15.4	11.3
Docena Clara	Quint 2 $\frac{2}{3}$ '					
ø		67.5	52.1	35.5	28.5	20.5
mouth width		50	34.8	26	21	14.8
cut-up		15	13.7	10	8	5.7
Docena Nasarda	Open Fluit 2 $\frac{2}{3}$ '					
ø		97.3	76.8	63.8	40.3	31.2
mouth width		64	51.5	37	27.8	21.5
cut-up		18	16	12.7	9.6	8.2
Quincena Clara	Octaaf 2'					
ø		46	37.1	30.6	23.9	17
mouth width		35.8	26.4	21.9	18.1	13.4
cut-up		10.9	11.5	9.4	6.3	5.2

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Quincena Nasarda	Open Fluit 2'					
∅		81.2	66.2	46.7	39.8	26.6
mouth width		54	43.7	31.6	27.1	18.3
cut-up		17.5	13.4	11	9.4	6.8
Espigueta	Roerfluit 2'					
∅		56.1	47.1	31.8	25.3	21.3
mouth width		39	33.6	23.7	17.6	14.4
cut-up		14	13.8	9.4	7.5	6.5
Diez y Setena Nasarda	Open Fluit 1 3/5'					
∅		63.4	56.4	37.7	30.9	22
mouth width		42.8	39	22.6	22	14.4
cut-up		14.6	14	10.7	7.6	6
Diez y Novena Clara	Quint 1 1/3'					
∅		36.5	28.3	21	17.7	13.1
mouth width		25	20	15.6	12.7	9.6
cut-up		9.2	7.9	6.7	5.7	4.4
Veinte y Docena Clara	Octaaf 1'					
∅		29.1	25.5	18.3	16.2	12.9
mouth width		18.7	15.7	13	10.3	8.2
cut-up		7.3	6.8	4.8	4	2.6
Veinte y Docena Nasarda	Open Fluit 1'					
∅		44.6	40.4	25.8	23.2	18.6
mouth width		29.5	16.8	17	15	13.1
cut-up		10	10.7	5.8	5.6	3.7
Lleno	Mixtuur V					
∅	1'	30	23.8	17	14.5	12
mouth width		23	17.2	12	10.8	7
cut-up		8	6	5	3.8	2.8
∅	2/3'	20.4	17	12.8	10.8	9.2
mouth width		14.5	11.5	9.8	7.3	6.3
cut-up		6.3	5	4	3.2	3
∅	1/2'	17.2	15	11.7	9.3	6.8
mouth width		13	9.8	8.8	6.7	4.7
cut-up		4.8	4.2	4	3.3	2.7
∅	1/3'	14.8	12.8	10.5	9	8
mouth width		9	8	7.5	5	6
cut-up		4	3	2.8	1.8	1.8
∅	1/3'	14.5	12	10	8.2	7.2
mouth width		10.5	8	7	5.8	5.2
cut-up		4	4.2	3	3	2
Simbala	Scherp III					
∅	2/3'	21.6	17.5	13	12	8.2
mouth width		15.5	14.5	9.7	8.7	5
cut-up		5.8	4.8	3.8	3.8	3
∅	1/2'	15.5	13.2	11	10	8
mouth width		11.2	9.2	8	7.2	5.6
cut-up		4.5	4	3.8	3.5	2.8
∅	1/3'	14.2	12.2	9.2	7.8	7.2
mouth width		10	8	7	5.8	5
cut-up		4	4.2	3	2.8	1.5

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Sobre Simbala	Cymbel II					
ø	1/3'	14	12.5	10.2	8.2	8.7
mouth width		10.5	7.5	6	6	5
cut-up		4	2.7	2.2	1.7	1.8
ø	1/4'	12.7	10.7	8.3	7	6
mouth width		9.3	7.8	6	5.1	4.4
cut-up		3.3	3	2	1.8	1.8
Trompa Real	Trompet 8					
ø upper		110	105	86	77	76
ø lower		28	28	28	23	19
tongue width		14	11	10.5	9	9

Chamade Registers, Choir Side

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Bajoncillo	Trompet 4'					
upper ø		70	67.5	62.5	60.5	58
lower ø		18	18	18	15.5	14
tongue width		13.9	11.5	10.5	9.4	7.1
Orlo	Trompet 4'					
upper ø		79.5	75.5	65	61.4	57.5
lower ø		19.5	19	17	15.5	13.5
tongue width		12.5	12.2	8.1	7.8	6.4
Clarín en Quincena	Trompet 2'					
upper ø		67.5	61	54.3	50.3	38.1
lower ø		17	16	14	13	12.5
tongue width		9.9	8.7	6.3	6	4.9

Chamade Registers, Nave Side

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Chirimía	Hobo 4'					
cylinder ø		33.6	30.4	35.2	22.9	20.7
tongue width		10.1	9.2	7.7	6.5	6.2
Clarín Claro	Trompet 4'					
upper ø		79.5	75.5	65.9	61.9	58
lower ø		18.5	17.5	17.5	15	14.2
tongue width		13.2	11.1	8.9	6.7	6.7
Clarín en Quincena	Trompet 2'					
upper ø		67.5	61	54.3	50.3	41.7
lower ø		15.5	15	13.5	13.5	15
tongue width		10.8	7.8	7	5.5	5.5

Organo Principal, Treble Registers

Pipe Rank	Range c#-d'''	Pipe				
		c#'	f'	c''	f''	c'''
Flautado de 26	Prestant 16'					
ø		76×62	58×46	43×33	42×32	36×26
mouth width		62	48	36	31	26
cut-up		24	17	13	14	10
Flautado Mayor	Prestant 8'					
ø	choir side	50.5	43	31	26.5	20
mouth width		36.9	31.4	22.6	19	14.6
cut-up		11.5	10.4	7.5	6.5	5
Flautado Mayor	Prestant 8'					
ø	nave side	49.8	43	31	26.5	20
mouth width		36.9	31.4	22.8	19.7	14.6
cut-up		11.2	8.7	7.2	6	4.5
Violon	Gedekt 8'					
ø		40.4	35.4	26.6	23.1	19.7
mouth width		29.5	26.2	19.2	17.5	16.2
cut-up		15.7	14.8	11.4	8	7.3
Flauta Traversa	Zweving 11 8'					
ø		28×25	23×23	20×20	19×19	16×16
mouth width		28	23	23	19	16
cut-up		15	14	11	9	6
ø	8'	28×27	23×23	20×20	19×19	16×16
mouth width		27	23	20	19	16
cut-up		14	14	11	8	6
Octava Clara	Octaaf 4'					
ø		25.5	25.5	18.2	14.8	11.5
mouth width		19.8	18	13	10.5	8.5
cut-up		7.5	7.3	5	3.8	3
Octava Nasarda	Open Fluit 4'					
ø		43.8	40.3	33.4	30.6	23.4
mouth width		30	25.4	21.4	20.4	15.5
cut-up		11.5	9.1	8	6.2	3.9
Espigueta	Roerfluit 4'					
ø		31.7	28	20.8	17.5	14
mouth width		24.2	20	14.7	11.8	10.6
cut-up		10.5	9.9	6	4.5	3
Docena Clara	Quint 2 ² / ₃ '					
ø		22.3	17.4	13.2	10.9	8.9
mouth width		14.3	12.4	9.2	7.7	6.5
cut-up		5.9	5.1	3.8	3	2.2
Docena Nasarda	Open Fluit 2 ² / ₃ '					
ø		34	30	24.4	15.6	11.8
mouth width		18	16	12.5	10.8	8.4
cut-up		7	7	5.3	3.8	3.3
Docena Nasarda	Open Fluit 2 ² / ₃ '					
ø		34.4	30.1	22.3	16.9	13.4
mouth width		24.1	20	15.1	11	8.4
cut-up		7.6	5.4	4.6	3.7	2.7
Quincena Clara	Octaaf 2'					
ø		17.2	14.3	10.7	9.2	7.9
mouth width		12	10.2	8	6.5	5.5
cut-up		4.9	4.8	3	2.5	2

Pipe Rank	Range c#-d'''	Pipe				
		c#'	f'	c''	f''	c'''
Quincena Nasarda	Open Fluit 2'					
∅		24	22.6	17.2	11.8	9.2
mouth width		16.8	15.8	11.5	8	7.1
cut-up		7	5.7	4	3.1	2.1
Diez y Setena Nasarda	Open Fluit 1½'					
∅		21	17.1	13.9	11	9.2
mouth width		13.5	11	9.2	8	6.4
cut-up		5.6	4.6	3.6	3.4	2.2
Diez y Novena Clara	Quint 1⅓'					
∅		13.5	11.3	9	8.2	7
mouth width		9	8	6.3	5.5	5
cut-up		3.9	3.8	2.5	2.3	1.8
Diez y Novena Nasarda	Open Fluit 1½'					
∅		22.1	19.4	13.4	12.1	10.2
mouth width		14.6	13	8.8	8.4	6.5
cut-up		5.6	4.6	3.6	3.1	1.6
Lleno	Mixtuur V					
∅	4'	27.7	22.7	17.5	15.2	12.7
mouth width		21.2	15.5	13.2	10.8	9
cut-up		7	7	4.7	4.4	3.2
∅	2⅔'	20	16.9	13.8	12.7	9.9
mouth width		15	12.5	10	9.5	7
cut-up		6	4.5	3.8	3.2	2.5
∅	2'	16.8	14.4	12.7	10.8	8.4
mouth width		12	9.7	8.2	7.5	6
cut-up		5	5	3.3	2.8	2.3
∅	1⅓'	18.8	15	10	8	8
mouth width		13	10.5	7.2	5.5	6.4
cut-up		5	4.3	3.8	2.8	2
∅	1⅓'	13	11.8	10.2	9	6.8
mouth width		8.8	8	7	6.2	5
cut-up		3.8	3.8	2.8	2.2	1.6
Simbala	Scherp II					
∅	2'	16.5	14.3	10.8	10	8.6
mouth width		11.7	10	7.7	7	6
cut-up		5	4.4	3	2	2
∅	1⅓'	14	11	10	8.4	6.7
mouth width		9.5	8	7	6	5
cut-up		5.4	3.3	2.5	2	1.8
Sobre Simbala	Scherp III					
∅	2'	15.8	15.5	11	12	8.6
mouth width		11.8	10	7.6	7	6
cut-up		5.2	5	3.5	2.8	2
∅	1⅓'	15.7	13	10.8	10	8
mouth width		11.2	10	8	7	5
cut-up		5.3	4.8	3.5	2.5	1.7
∅	1'	11.3	10	8	7.3	6.7
mouth width		8	7.7	5.5	5	5.3
cut-up		3.3	2.7	2.5	2.4	1.2
Tolosano	Sesquialter III					
∅	3⅓'	23.3	24	18.9	15.9	11.9
mouth width		16.4	17.5	13	11	8
cut-up		6.3	7	5.2	4.5	3

Pipe Rank	Range c#-d'''	Pipe				
		c#'	f'	c''	f''	c'''
ø	2 $\frac{2}{3}$ '	21	19.4	14.2	12.3	9.2
mouth width		15	10.5	9	8	6
cut-up		5.2	5.4	3.8	3	2.2
ø	2'	20.5	18	14	11.4	8.6
mouth width		12.5	12.2	9	8.2	5.5
cut-up		4.7	5	3.7	3	2
Corneta Magna	Cornet VII					
ø	Roerfluit 8'	52	44.5	34	30	25.5
mouth width		37	33	20	21	16.5
cut-up		15	11.5	9	9.5	6
ø	open 4'	43	36.5	29.5	23	16.5
mouth width		29	24	19	14	11
cut-up		10	9	6	5	3.6
ø	open 2 $\frac{2}{3}$ '	31	26	22	20.2	15.5
mouth width		20	17	14.5	12.8	10
cut-up		7.5	6	5	3.5	3.5
ø	open 2'	27	23	17.5	17	10.5
mouth width		18	15	12	11	7
cut-up		6	5	3.7	4	2.5
ø	open 2'	24.5	22.5	18	14.5	11
mouth width		16.5	14	11.5	10	7
cut-up		5.8	5	4	3	2
ø	open 1 $\frac{3}{5}$ '	25.5	20	15.5	13.5	11
mouth width		16	13	10.5	9	5.7
cut-up		5	4.3	3	2.7	1.3
ø	open 1 $\frac{3}{5}$ '	21.2	19.7	13.9	11.5	9.9
mouth width		13.5	13	9	7.5	6.2
cut-up		5	4.5	3.8	2.2	2
Corneta en Eco	Echo Cornet VII					
ø	Roerfluit 8'	53	45	35	28.3	22
mouth width		40	34	26	21	16.5
cut-up		13.3	12.8	11	7.3	6.5
ø	open 4'	44.5	34.5	24.5	20	16.8
mouth width		32	25	18	13	10
cut-up		9	8.5	6	5	3.8
ø	open 2 $\frac{2}{3}$ '	33	24.5	19	14.5	10.8
mouth width		24.5	17.7	14	9.5	6.3
cut-up		7.5	7.2	5	3.5	2.8
ø	open 2'	24	20.8	15	12	10
mouth width		18	15	11.3	8.5	5.5
cut-up		5.5	5	4.3	3	2
ø	open 2'	24	20	15.8	12	8
mouth width		16	15	10.8	8	5
cut-up		6.8	5	3.8	3	2
ø	open 1 $\frac{3}{5}$ '	21	19	13	13	9
mouth width		15	13.7	9	8	7
cut-up		5.8	4	3	2.5	2
ø	open 1 $\frac{3}{5}$ '	22	18	13.5	12	9.3
mouth width		15	12.2	9	8.5	5.3
cut-up		6.2	5	3.5	2.8	2
Trompa Real	Trompet 8'					
upper ø		76	69	69	61	56
lower ø		19	17	15	14	15
tongue width		9.5	8.5	7.5	7	6

Chamade Registers, Choir Side

Pipe Rank	c#-d'''	c#'	f'	c''	f''	c'''
Trompa Magna	Trompet 16'					
upper ø		68.8	64	57.3	53.2	49.4
lower ø		19	17	15	13	11.5
tongue width		12.9	10.5	9.4	8.7	6.3
Chirimia	Hobo 16'					
cylinder ø		33	30.4	25.2	22.9	20.7
tongue width		11.8	11.3	7.5	7.3	6.7
Clarín de Campana	Trompet 8'					
upper ø		76	70	64	56.5	50
lower ø		19.5	18.5	18	15.5	12
tongue width		11.8	8.5	7.7	7	5.8
Clarín de Campana	Trompet 8'					
upper ø		76	70	64	56.5	50
lower ø		19.5	18.5	18	15.5	12
tongue width		11.1	8.6	7.2	6.4	5.4
Clarín Claro	Trompet 8'					
upper ø		87	78.2	69.4	63.4	59.6
lower ø		17	15.5	14	13	12
tongue width		11.6	9	6.1	5.3	5
Obue	Hobo 8'					
cylinder ø		36	34.1	30.3	28.7	27.1
tongue width		10.6	7.9	6.9	5.7	5.3

Chamade Registers Nave Side

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Bajoncillo	Trompet 16'					
upper ø		68.8	64	57.3	53.2	49.4
lower ø		19	18	14.2	12.5	12.2
tongue width		12.2	11.6	9.2	9.5	6
Clarín Claro	Trompet 8'					
upper ø		86.9	78.2	69.4	63.4	59.6
lower ø		17	16	14	12.7	12
tongue width		11.1	8.2	7	6	4.5
Obue	Hobo 8'					
cylinder ø		36	34.1	30.3	28.7	27.1
tongue width		10.8	8.5	6.2	6	5.3
Pipe Rank	solo c'-d'''	c'	f'	c''	f''	c'''
Violon	Gedekt 8					
ø		46.8	37.1	29.3	22.9	16.7
mouth width		33.5	24.1	20.7	15.5	11.5
cut-up		16	13	11.1	7	5.5
Docena Clara	Quint 2 $\frac{2}{3}$ '					
ø		22.6	18.3	13.5	11.5	9.1
mouth width		16.2	13.3	10.3	7.8	6.8
cut-up		6.5	6.2	4.1	4	3.4
Quincena Clara	Octaaf 2'					
ø		18.7	14.5	11.8	11.2	9.2
mouth width		14	10	9	7.8	5.8
cut-up		5.8	4.5	3.5	3.2	2.2

Pipe Rank	solo c'-d'''	c'	f'	c''	f''	c'''
Diez y Novena Clara	Quint 1 1/3'					
ø		13.5	11.8	8	7.5	7
mouth width		10	8	5	4.8	4.5
cut-up		4.2	4	3	2.3	2
Chirimia	Hobo 16'					
cylinder ø		30	27.5	24	22	21
tongue width		11	10	5	7.5	6
Violines	Schalmei 8'					
upper ø		68	64.5	58.3	52.5	49
lower ø		17.5	15.5	14.5	15	14.5
tongue width		10	10	9	8.2	6.8

Cadereta Exterior, Bass Registers

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Octava Clara	Octaaf 4'					
ø		97.5	69.5	51	42.5	32
mouth width		71.2	50.8	37.2	31	23.4
cut-up		20.8	14.5	11.3	10	8.3
Quincena Clara	Octaaf 2'					
ø		48.4	37.4	24.8	23.6	16.9
mouth width		35.6	26.6	18.6	17	12
cut-up		12.1	11.8	7.9	6.3	5.8
Veinte y Docena Clara	Octaaf 1'					
ø		30.7	22	16.8	14.2	12
mouth width		23	14.5	10.5	10	6.8
cut-up		9.5	8	5.5	4.5	3.1

Cadereta Interior, Bass Registers

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Violon	Gedekt 8'					
ø		121.8	99.7	69.1	56.8	42.4
mouth width		91.6	70.2	50.9	42.5	32.1
cut-up		29.1	22	20.5	20.4	17.9
Octava Nasarda	Open Fluit 4'					
ø		89.2	74.5	51.6	40.9	28.4
mouth width		67.3	53	37.5	29.2	21.2
cut-up		19.6	17.4	13.8	10.2	8
Diez y Setena Clara	Terts 1 1/5'					
ø		39.3	32	25	21.7	16.8
mouth width		29	23.8	17.7	15.5	10.2
cut-up		10.8	9.5	7.2	5.2	4.9
Diez y Novena Clara	Quint 1 1/3'					
ø		35	28	20	16.4	13.6
mouth width		24.8	19.6	15	12.2	10.8
cut-up		10.2	7.9	6	5	4

Pipe Rank	C, D-c'	C	F	c°	f°	c'
Veinte y Docena Clara	Octaaf 1'					
∅		30.8	30.2	21.3	17.4	14.7
mouth width		22	22.5	15.3	10.8	8.9
cut-up		6.5	6	5.3	4	3.2
Lleno	Mixtuur III					
∅	$\frac{2}{3}'$	21.8	18.2	13.7	11.8	9.2
mouth width		14.8	13.5	10.5	9	7
cut-up		6	4.9	4.8	3.5	3
∅	$\frac{1}{2}'$	17	14.9	12	10	7.2
mouth width		12.8	11.2	8.8	7	5
cut-up		5	4.8	3.9	3.2	2.3
∅	$\frac{1}{3}'$	13.2	12.4	10	10	7
mouth width		8.8	9.2	6.3	6.2	4.7
cut-up		4	4.2	2.8	2.8	1.5

Cadereta Exterior, Treble Registers

Pipe Rank	c'-d'''	c#'	f'	c''	f''	c'''
Octava Clara	Octaaf 4'					
∅		27.2	24.4	18.6	15.9	13.1
mouth width		19.2	18.5	13.6	12	8.6
cut-up		8	7.6	5.6	4.6	4.3
Quincena Clara	Octaaf 2'					
∅		15.9	14	11.1	9.7	8.4
mouth width		8.7	8.2	8	7.8	6.3
cut-up		4.9	4	3.7	3.6	2.9
Diez y Novena Clara	Quint 1 $\frac{1}{3}'$					
∅		13.5	11.9	8.9	7.6	7.2
mouth width		9.7	6.7	6.8	6	5.4
cut-up		4	2.4	3.1	2.8	2
Corneta Magna	Cornet V					
∅	Roerfluit 8'	50.9	44.1	33.4	29.3	23.2
mouth width		37	32	24	21	16.8
cut-up		13.8	12	10	7.7	6
∅	Open 4'	44.3	38.8	27	21.8	15.8
mouth width		28.4	25	18	14.3	12.2
cut-up		9.6	10	7	6.5	3.6
∅	Open 2 $\frac{2}{3}'$	31.2	27	20	17.2	12.2
mouth width		20.7	17.5	13.8	11.3	8
cut-up		7.7	6	5	3.8	3
∅	Open 2'	25	22.2	16	12.5	11
mouth width		16	14.2	10.8	8.2	7.2
cut-up		5.3	5.5	3.8	2.7	2
∅	Open 1 $\frac{3}{5}'$	21.7	18.2	14.3	13.2	9.4
mouth width		13.8	11.2	9.5	8.8	6.4
cut-up		5.7	5.2	2.8	2.4	1.4

Cadereta Interior, Treble Registers

Pipe Rank	c'-d'''	c#'	f'	c''	f''	c'''
Flautado Mayor	Prestant 8'					
ø		50	40.6	32.5	24.8	19.1
mouth width		32	26.6	22.3	18	14.1
cut-up		11.2	9	8	6.5	5.8
Violon	Gedekt 8'					
ø		41.2	35.7	26.6	22.9	20.5
mouth width		29.3	26.1	20.4	16.4	15
cut-up		16	14.5	10.5	9.8	7.1
Octava Nasarda	Open Fluit 4'					
ø		40.4	36.6	30.9	22.9	16.1
mouth width		29.8	27	25.7	17	10.4
cut-up		10.7	9	6.8	6	4.4
Docena Clara	Quint 2 ² / ₃ '					
ø		20.1	17	13.9	11	9.6
mouth width		15.8	12	10.7	8.3	6.6
cut-up		6.2	5.2	4	3.9	2.9
Diez y Setena Clara	Terts 1 ³ / ₅ '					
ø		18	13.2	11.1	9.7	8.1
mouth width		11.9	10	8.1	7	6.2
cut-up		4.6	4	3.7	3.4	2.6
Lleno	Mixtuur III					
ø	2- ² / ₃ '	21	17.7	14.5	12	9
mouth width		15.6	13.9	10	8	7
cut-up		5.4	5	3.9	4	3.3
ø	2'	14	12.4	10.5	9.7	9
mouth width		10	9	7	7.4	6
cut-up		5	4.4	3.5	3.6	2
ø	1- ¹ / ₃ '	14.3	11	10.5	8	7
mouth width		10.3	8.7	7	5.7	4.8
cut-up		4	4.2	2.5	2.5	2
Tolosana	Sesquialter III					
ø	3 ¹ / ₅ '	24	21.9	17	15.2	9.1
mouth width		17.7	15	11.8	9.8	6.5
cut-up		6.3	5.5	4.8	4.8	2.5
ø	2 ² / ₃ '	22	17	13.9	11.3	8.6
mouth width		15	12	10.2	8.5	6.5
cut-up		6	6	3.8	3.2	2.2
ø	2'	17.8	15.3	12.1	9.2	7.3
mouth width		13	11	9	7	5.5
cut-up		4.8	4.5	3.2	2.3	2

Pedal Registers

Pipe Rank	C, D, E-B	C	F	B
Flautado	open 16'			
ø		325	280	197
mouth width		237	204.5	144
cut-up		68	57	41.8
Flautado	open 8'			
ø		166	158	114
mouth width		121	115.5	83.2
cut-up		30	28	24
Flautado	open 4'			
ø		119	114	78
mouth width		87	83.2	61
cut-up		22.8	20.5	17.8
Bajoncillo	Trompet 16'			
upper ø		180×180	170×150	123×123
lower ø		30	30	30
tongue width		27/25.5	22.8	21.3
Bajoncillo	Trompet 8'			
upper ø		109	100	83
lower ø		27	26	23
tongue width		15	14.5	12
Bajoncillo	Trompet 4'			
upper ø		81	76	71
lower ø		18	21	20
tongue width		13	10.8	10

Epistle Organ Pipe Scales

Organo Principal, Bass Registers

Pipe Rank		C–c'	C	F	c ^o	f ^o	c'
Flautado Mayor	Prestant 8'						
∅	choir side	165	136	87	78	59	
mouth width		120.5	99.3	63.5	57	43.1	
cut-up		32	26	20.2	18	14	
Flautado Mayor	Prestant 8'						
∅	nave side	165	134.7	90	68.5	54	
mouth width		120.5	98.4	63.6	50	39.4	
cut-up		30	25	19	14.9	11.6	
Flautado Mayor	Prestant 8'						
∅	wood	145×117	110×102	80×60	65×50	41×40	
mouth width		117	102	60	50	40	
cut-up		30	30	28	18	20	
Violon	Gedekt 8'						
∅		119×94	100×81	74.8	60	44.5	
mouth width		94	81	59.7	47.2	34.8	
cut-up		26	24	26.3	19.5	15.2	
Octava Clara	Octaaf 4'						
∅		85	65	45.5	35.8	26.6	
mouth width		66.6	49.4	35	26.6	20.1	
cut-up		19.1	15.3	12.7	10.3	9.6	
Octava Nasarda	Open Fluit 4'						
∅		126.9	100.2	74.5	61.1	44.7	
mouth width		84.5	66.2	47.5	39.8	29	
cut-up		18.4	20.3	16	14	11.7	
Docena Clara	Quint 2⅔'						
∅		59.9	45.9	32.5	28	19.4	
mouth width		44.2	33.6	24.4	17	14	
cut-up		15.8	12.7	9.4	9.2	6	
Docena Nasarda	Open Fluit 2⅔'						
∅		90.4	71.7	61.2	48.4	36.4	
mouth width		60.4	51.7	42.1	33.2	24.5	
cut-up		19.4	16.4	12.1	11.1	7.3	
Fabiolete	Nasard 2⅔'						
∅		89.2/63.7	69.9/47.9	54.1/37.3	43.6/31.4	36.3/28.5	
mouth width		45.1	36.4	29.3	22.2	17.9	
cut-up		18	15.6	12.9	11	9	
Quincena Clara	Octaaf 2'						
∅		43.5	34.5	27.4	23.1	17.4	
mouth width		34.7	26.9	22.2	18.2	13	
cut-up		12	10.8	9.2	7.7	5	
Espigueta	Roerfluit 2'						
∅		57.8	42	36.2	32.3	28	
mouth width		51.2	39	32.7	27.8	24	
cut-up		12	10.8	9.2	7.7	5	

Pipe Rank	C-c'	C	F	c°	f°	c'
Quincena Nasarda	Open Fluit 2'					
∅		74.5	59.6	44	35.2	24.8
mouth width		51.4	41.5	26.9	20.8	16
cut up		15.9	14.2	10.6	8.3	5.4
Diez y Setena Clara	Terts 1 $\frac{3}{5}$ '					
∅		43	39.3	29.1	24	16.8
mouth width		31.1	25	19	16	12
cut-up		12.3	10.1	6.7	5.2	5.2
Diez y Setena Nasarda	Terts Fluit 1 $\frac{3}{5}$ '					
∅		68.4	60	38.8	31.5	28.8
mouth width		40.8	40.5	27	21.6	19.9
cut-up		16.2	14.1	7.8	6.1	5.4
Diez y Novena Clara	Quint 1 $\frac{1}{3}$ '					
∅		35.8	28.5	26.2	23.5	13.9
mouth width		25.2	19.6	18.1	16.7	10.1
cut-up		9.3	7.3	5.1	6.1	4.7
Veinte y docena Clara	Octaaf 1'					
∅		28.9	24.2	18.6	15.3	12.4
mouth width		17.5	14.8	11.1	9.6	7.2
cut-up		8.3	6.2	4.8	4.5	3.3
Lleno	Mixtuur V					
∅	1'	30.9	25.5	18.8	16.7	13.4
mouth width		20	18.5	13.7	11.8	8.4
cut-up		7.2	6.3	5.1	4.9	3.7
∅	$\frac{2}{3}$ '	22.8	19.9	15.1	13.3	11
mouth width		15.7	14.1	10.5	9.2	8.1
cut-up		7	5.5	4.5	3.7	3
∅	$\frac{1}{2}$ '	19.4	16.5	11.9	9.8	8.5
mouth width		12.5	11.3	8.9	5.7	6.1
cut-up		5	5.2	3.8	3	2.5
∅	$\frac{2}{5}$ '	16.2	14	11.9	9.6	8.5
mouth width		11	9.5	7.5	7.2	5.9
cut-up		5	3.8	3.2	2.9	2.5
∅	$\frac{1}{3}$ '	14	13.6	11	10.4	7.8
mouth width		10.9	10	6.8	6.5	5
cut-up		4.8	4.3	4	2.1	2.1
Simbala	Scherp III					
∅	$\frac{2}{3}$ '	23.2	18.5	14.6	11.8	9.6
mouth width		16	13	10.5	8.5	7
cut-up		6	4.8	4.8	3.1	2.8
∅	$\frac{1}{2}$ '	18.5	15.6	12.1	10.5	8.6
mouth width		13	11	8.5	7.5	6
cut-up		5	4.5	3.2	2.8	2.5
∅	$\frac{1}{3}$ '	15	11.8	9.9	8.9	7.6
mouth width		10.5	8.5	7	6.5	5.5
cut-up		4.3	3.2	2.9	2.3	2
Sobre Simbala	Cymbel II					
∅	$\frac{1}{3}$ '	13.4	11.7	9.9	8.6	7.6
mouth width		10.6	8.6	6.5	6	5.4
cut-up		4.3	3.9	2.9	2.3	2
∅	$\frac{1}{4}$ '	11.8	10.2	8.6	8	7.2
mouth width		8.3	7.2	6	5.5	5
cut-up		3.3	2.8	2	2	1.9

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Trompa Real	Trompet 8'					
upper ø		109	93	87	77	67
lower ø		22.2	25.5	24.5	23.2	19.3
tongue width		14	12	11.9	8	7.6

Chamade Registers, Choir Side

Pipe Rank	C-c'	C	F	c°	f°	c'
Orlo	Trompet 4'					
upper ø		78	74	66.5	58	48
lower ø		20.5	20	19	17	16
tongue width		14.5	12	11.2	9.4	8.7
Bajoncillo	Trompet 4'					
upper ø		82.5	74.5	66.5	62	58.5
lower ø		19	17	16	15	12
tongue width		12	11.5	8.5	8	6.6
Clarin en Quincena	Trompet 2'					
upper ø		67.5	61.2	53.7	49	48
lower ø		17	15	13	13.3	13.3
tongue width		9.8	7.2	7.4	6.5	5.5

Chamade Registers, Nave Side

Pipe Rank	C-c'	C	F	c°	f°	c'
Bajoncillo*	Trompet ?'					
upper ø		150×145	113	90	85	77
lower ø		25	22	19.7	17.3	18
tongue width		19.3/16	18.3	14	13	12
Clarin Claro	Trompet 8'					
upper ø		95	90	75	73	64
lower ø		21	19	19	17.7	17.3
tongue width		15	13.3	12	11.4	9
Obue	Hobo 4'					
upper ø		86.2	82.5	67.8	60.2	47.2
lower ø		33.6	29.9	24.8	22.8	21.3
tongue width		12.5	9.6	7.7	6.9	5.5

* Bajoncillo stands inside the organ. Resonators are of wood.

Organo Principal, Treble Registers

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Flautado de 26	Prestant 16'					
∅		76×59	63×49	43×35.5	39×21.5	30.5×20
mouth width		59	49	35.5	21.5	20
cut-up		19.3	13.1	12.4	11.8	11.4
Flautado Mayor	Prestant 8'					
∅	choir side	53	45.2	30	26.3	20.5
mouth width		38.7	33	21.9	19.2	15
cut-up		11.1	9.6	7.1	6.2	5.1
Flautado Mayor	Prestant 8'					
∅	nave side	57	49	31	26.3	20.5
mouth width		41.6	35.8	22.6	19.2	15
cut-up		12.8	11	7.2	5.8	4.8
Flauta Traversa	Zweving II 8'					
∅		30×25	27.5×25.5	23×18.5	18.5×16.5	15×14
mouth width		25	25.5	18.5	16.5	14
cut-up		10.4	9.4	11.4	8.7	7.3
∅		31×29	28×26	22.8×19.8	20×17	15×13
mouth width		29	26	19.8	17	13
cut-up		14.2	12	8	8.2	5.6
Violon	Gedekt 8'					
∅		47	39.5	29	25	20.4
mouth width		31.8	25.8	19	14.9	13
cut-up		13.7	12.7	9	8.8	5.8
Octava Clara	Octaaf 4'					
∅		29	23	17.3	15.1	11.8
mouth width		18.5	17	13.1	9.2	8.8
cut-up		7	6.4	5.2	3.6	3.2
Octava Nasarda	Open Fluit 4'					
∅		41.8	38.5	25.6	22.2	17.2
mouth width		27.3	26	17.5	14.7	11
cut-up		9.1	8.4	6	5	4.3
Espigueta	Roerfluit 4'					
∅		32	26.4	22.5	20.5	14.6
mouth width		23.8	20.3	17.8	15.7	11.7
cut-up		10.5	8.4	6.4	6	3.4
Docena Clara	Quint 2⅔'					
∅		22.3	19.1	15.1	13.6	11.4
mouth width		14.1	13.1	9.6	8.7	8.4
cut-up		6	5.5	4.2	4.2	3
Docena Nasarda	Quint Fluit 2⅔'					
∅		32.2	27.8	21.3	18.5	15.9
mouth width		21	18	14.1	12	10
cut-up		8.3	7	4.7	4.2	3.2
Quincena Clara	Octaaf 2'					
∅		18	16.5	13	10.3	9.7
mouth width		11.7	11.1	9.5	8	6.3
cut-up		4.8	4.5	3.4	2.6	2.1
Quincena Nasarda	Open Fluit 2'					
∅		26.4	22.3	18	15.6	13.1
mouth width		18	14.5	11.5	10	8.5
cut-up		6.5	5.1	4.3	3.4	3

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Diez y Setena Clara	Terts 1½'					
∅		16.5	15.7	11.4	10.3	9
mouth width		12	10.4	8.6	7	6.5
cut-up		4.3	3	2.4	2	2
Diez y Setena Nasarda	Terts Fluit 1½'					
∅		23.6	19.6	15.9	14	12.1
mouth width		16	13	10.5	9	7.5
cut-up		5.1	4.5	3.7	3.5	2.3
Diez y Novena Clara	Quint 1½'					
∅		15.6	13.2	10.3	9	9.1
mouth width		9.4	10	7.4	6.1	5.7
cut-up		3.5	3.5	2.5	2.3	1.5
Lleno	Mixtuur V					
∅	4'	24.6	25.1	20.4	14.6	12.6
mouth width		16.1	15.8	14	8.4	8.2
cut-up		5	6.2	5.1	4.1	3.7
∅	2⅔'	21.3	21	15.8	11.7	7.4
mouth width		15.5	14	11.2	6.4	4.6
cut-up		6.8	6	4.5	3.6	1.8
∅	2'	19.3	18.2	13.5	11.9	7.8
mouth width		12.5	11.1	8.5	6.5	4.8
cut-up		5.5	4.5	3.5	3.4	2
∅	1⅓'	17.2	13.3	10.5	8.8	7.3
mouth width		11	8.8	5.1	4	4
cut-up		5	3.2	2.8	2.8	1.8
∅	1½'	15.8	14.1	9.2	7	7
mouth width		10.2	9.8	5.9	4	3.8
cut-up		4.8	3.8	2.8	2.1	1.5
Tolosana	Sesquialter III					
∅	3½'	32.5	28.3	23	17.6	13.1
mouth width		21	18.3	15	11.1	9
cut-up		8.2	6.2	5.5	4	3.3
∅	2⅔'	27.7	23.2	19.1	17.2	13.1
mouth width		18.5	15.3	13.1	11.5	9
cut-up		6.8	5.2	4.5	4.2	3.2
∅	1½'	20.4	17.8	14.6	12.4	10.2
mouth width		13.5	12	9.5	8.3	6.8
cut-up		4.5	4.4	3.9	2.2	1.9
Simbala	Scherp III					
∅	2⅔'	19.5	19.2	13.2	12.5	8.5
mouth width		14.5	13.5	9.8	8.7	7
cut-up		6.1	5.8	4.5	3.7	2.1
∅	2'	17.1	16.7	12.5	11.3	9.2
mouth width		10.6	10.2	8.6	7.6	6.4
cut-up		5.1	4.8	4.6	3.1	2.8
∅	1'	13.9	12.7	9.9	7.5	6.5
mouth width		9.4	9	7	5	4.5
cut-up		3.9	3.4	2.3	2	1.7
Sobre Simbala	Cymbel II					
∅	2'	16.8	15.6	11.9	9.9	8.6
mouth width		10.1	10.9	7.4	6.7	5.3
cut-up		4.9	4.3	4.2	2.7	2.6

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Sobre Simbala	Cymbel II					
ø	1 3/5'	17.8	12.9	9.9	9	7.6
mouth width		10.2	9.1	7.1	6.6	4.4
cut-up		4.6	4.6	3	2.9	2.3
Corneta Magna	Cornet VII					
ø	Roerfl. 8'	51.2	43	34	28.4	21.6
mouth width		40.8	33.7	26	20.7	16.6
cut-up		16.9	11.5	10.3	9.9	6
ø	open 4'	43.8	33.4	23.4	21.7	17.5
mouth width		33.8	25	17.8	14.3	13
cut-up		10.7	9.3	6	5.1	3.9
ø	open 2 3/5'	32	26.1	19.7	15.8	12.7
mouth width		24.4	19.1	14.2	11.3	11.5
cut-up		8	6.6	5.2	4.1	2.1
ø	open 2'	24.8	22.1	15.1	14.5	10.7
mouth width		17.8	16.6	11.3	9.9	6.7
cut-up		6.4	5.7	3.4	3.2	2.1
ø	open 2'	23.3	22.2	15.2	14	8.9
mouth width		18	16.4	11.1	10.2	5
cut-up		6.4	5.8	3.9	3.6	2.2
ø	open 1 3/5'	22.9	19.3	14.1	11.4	9.2
mouth width		15.7	13.5	10.3	7.8	6
cut-up		4	4.2	3.2	2.8	2.2
ø	open 1 3/5'	22.7	18.9	15	10.2	9.3
mouth width		16.8	13.1	9.8	7	5.1
cut-up		5.1	4.6	3.1	2.8	2.6
Corneta en Eco	Echo Cornet VII					
ø	Roerfluit 8'	55	45.5	33.7	28.3	20.4
mouth width		37.4	32	23	19.6	14.5
cut-up		15.6	12.6	9.8	8.2	4.4
ø	open 4'	48.2	38	29	23	17.4
mouth width		34.4	26.3	20.1	15.4	12.3
cut-up		9.5	7.1	6.2	5.5	3.8
ø	open 2 3/5'	32.6	27.9	21.2	17.1	14.1
mouth width		23.1	19	15.3	12.4	10
cut-up		6.2	6.5	4.3	3.3	2.2
ø	open 2'	28.7	22.2	17	15.4	11.5
mouth width		20.1	15.4	12.2	11.1	8.6
cut-up		6.4	4.4	3.6	3.1	2.1
ø	open 2'	22	24.2	17.8	15.3	12.9
mouth width		14.8	16.9	11.8	11.1	8.5
cut-up		6.5	5	3.8	3.1	2.3
ø	open 1 3/5'	26.2	19.8	16.1	12	13.1
mouth width		16.9	13.5	9.8	8.3	7.8
cut-up		4	3.8	3.7	2.2	2.5
ø	open 1 3/5'	22.1	18.8	15.9	13	9.6
mouth width		13.8	10.7	10.7	8.5	5.1
cut-up		5.6	4.6	3.5	2.5	1.5
Trompa Real	Trompet 8'					
upper ø		73	70	59.4	50	38
lower ø		15.5	17	13.3	11.7	13
tongue width		7.5	7	6.8	6	4

Chamade Registers, Choir Side

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Trompa Magna	Trompet 16'					
upper ø		68.8	64	57.3	53.2	49.4
lower ø		17.5	17	14	12.5	12
tongue width		12.5	12	9.5	8.3	6.2
Chirimia	Hobo 16'					
upper ø		86	82.5	67.8	60.2	47.2
lower ø		19	18.5	14	13	11
Clarín Claro	Trompet 8'					
upper ø		67	61.5	54.5	49.5	46.5
lower ø		12	11	11	10	9
tongue width		8.7	7.9	6.7	6.5	5.5
Clarín Claro	Trompet 8'					
upper ø		84	77	68	62	58
lower ø		17	16	14	12.5	11.5
tongue width		10.7	8.7	7.7	5.5	5
Clarín Claro	Trompet 8'					
upper ø		86.9	78	69	63	59
lower ø		17	16	14	12.5	11.5
tongue width		10.8	8.7	7.6	5.5	5
Obue	Hobo 8'					
upper ø		91	82	70.5	61.1	42
lower ø		16	16	14	12	12
tongue width		11	8.1	7.8	6.6	4.6

Chamade Registers, Nave Side

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Trompa Magna	Trompet 16'					
upper ø		73	68	62	53	50
lower ø		19	17	18	17	15.8
tongue width		11	9.5	8	7	7
Clarín Claro	Trompet 8'					
upper ø		55	55	46	42	34
lower ø		16.3	16.3	15.6	15.8	12
tongue width		8	7	5.8	5.2	4.5
Obue	Hobo 8'					
upper ø		91.2	81	70.5	61	41.8
lower ø		16	16	13.5	12	12
tongue width		10.4	8.3	7.6	6.5	4.4

Cadereta Exterior, Bass Registers

Pipe Rank	C-c'	C	F	c°	f°	c'
Octava Clara	Octaaf 4'					
∅		87	66	51	40	28
mouth width		63.5	48.2	37.2	29.2	20.4
cut-up		20.1	13.3	11.2	9.4	7.7
Quincena Clara	Octaaf 2'					
∅		48	37	27	23	16.5
mouth width		35.6	26.6	19.4	16.8	12
cut-up		12.2	10.1	8.3	6.2	5.7
Viente y Docena Clara	Octaaf 1'					
∅		30	22.5	16.5	13	11.8
mouth width		21	15.7	11.3	9	8
cut-up		8.5	8.1	5.9	4.3	3.6

Cadereta Interior, Bass Registers

Pipe Rank	C-c'	C	F	c°	f°	c'
Violon	Gedekt 8'					
∅		132.2	98.2	79	65.6	53.8
mouth width		92	65	53.5	45.1	35
cut-up		34	23	19.2	17.5	14.3
Octava Clara	Octaaf 4'					
∅		88.9	71	53.5	45.1	34.6
mouth width		62	47	31.8	29.5	23
cut-up		20.5	16.1	11	9	9.1
Docena Clara	Quint 2½'					
∅		64.2	60.6	44.5	41.4	30.8
mouth width		45.1	46	33.1	28.6	20.7
cut-up		16.3	15.1	12	11	7.3
Diez y Setena Clara	Terts 1½'					
∅		39.6	29.1	22.8	18.3	14.5
mouth width		29.5	22.7	17.6	13	8.8
cut-up		11.1	9.5	4.3	5.4	4
Diez y Novena Clara	Quint 1½'					
∅		32.8	26	19.8	15.8	13
mouth width		26	19.4	15	10.1	9.9
cut-up		9	7.3	6.7	5	4.1
Lleno	Mixtuur III					
∅	⅔'	23	18.3	15	12.2	10.1
mouth width		17.6	13.2	11.1	9.4	7.0
cut-up		5.9	5.2	4.8	3.6	2.8
∅	½'	18.7	15.9	13.2	11.2	9.3
mouth width		11.5	11	9.2	7.8	6.8
cut-up		5.3	5.8	3.5	3.2	2.5
∅	⅓'	14.8	12.1	10.2	9.1	7.8
mouth width		11.2	9.3	7.2	6.7	6.2
cut-up		4.7	3.5	2.9	2.6	2.5
Bajoncillo	Trompet 4'					
upper ∅		81	74	65	62	58
tongue width		12	11	9	8	6.5

Cadereta Exterior, Treble Registers

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Fabiolete	Gemshoorn 4'					
ø		43/31	38/38	31.5/24	27/21	21/17.5
mouth width		24	20	16.5	14	10.5
cut-up		7.8	6.2	5.1	4.6	3.6
Quincena Clara	Octaaf 2'					
ø		16	14.5	12	9.5	7.5
mouth width		11	9.5	8.5	6.5	5.2
cut-up		3	2.6	2.3	2.1	1.9
Diez y Setena	Octaaf-Terts II					
ø	2'	15.5	14	12	9.5	7.5
mouth width		11	9.5	8.5	6.5	5.2
cut-up		3.2	2.9	2.6	2.1	1.7
ø	1 3/5'	14.2	12.5	10	8.5	7
mouth width		10	8.5	7	6	5
cut-up		3.1	2.7	2.4	1.9	1.8
Corneta Magna	Cornet V					
ø	Roerfluit 4'	53	44	33	26.5	19
mouth width		35	32.2	23	18.3	14
cut-up		13.8	10.7	8.1	6.3	4.8
ø	open 4'	38	34	27	24	19.5
mouth width		29	25.6	19.2	17	14.1
cut-up		8.2	7.8	6.3	5.1	4.3
ø	open 2 3/5'	32	28	22	20	17
mouth width		22.8	19.6	16	14.4	11.6
cut-up		6.8	6.4	4.8	4.4	3.9
ø	open 2'	24	21	16	13.5	9.5
mouth width		14.2	12.3	9.6	7.8	5.2
cut-up		4.3	4	3.1	2.5	2
ø	open 1 3/5'	20	18.5	13.5	11	9.5
mouth width		11.7	10.8	7.5	6.8	6
cut-up		4	3.7	2.4	2.2	2

Cadereta Interior, Treble Registers

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Flautado Mayor	Prestant 8'					
ø		49	43.3	33.8	26.9	21.5
mouth width		32.2	27.4	21.8	16.5	13.7
cut-up		9.7	10	8.5	7.2	5.7
Violon	Gedekt 8'					
ø		42	35.3	28.3	24.7	20.4
mouth width		32.2	27.7	21	18.2	15.4
cut-up		15.6	12.6	8.8	7.2	4.9
Octava Clara	Octaaf 4'					
ø		29.9	24.5	18.9	17	12.7
mouth width		19.2	16	13	10.8	8.8
cut-up		7.3	6.9	4.8	4.8	3.2

Pipe Rank	c#'-d'''	c#'	f'	c''	f''	c'''
Docena Clara	Quint 2 $\frac{2}{3}$ '					
Ø		23.1	19.7	14.4	11.2	9.5
mouth width		14.6	13	9.9	8.1	6
cut-up		5.1	3.7	3	3.1	2.5
Tolosana	Sesquialter III					
Ø	2 $\frac{2}{3}$ '	21	19.5	16	13	10
mouth width		15.1	13.3	11.8	9.8	7.5
cut-up		5.2	4.3	3.8	3.2	2.6
Ø	2'	17	16.7	13	12	9.5
mouth width		12.6	11.8	12.5	7.2	7.2
cut-up		4.6	5.7	4.1	3.8	2.3
Ø	1 $\frac{3}{5}$ '	17	14.3	11.5	10	9.2
mouth width		12.1	10.3	8.6	6.9	6
cut-up		3.9	3.5	2.9	2.4	2.1
Lleno	Mixtuur III					
Ø	2 $\frac{2}{3}$ '	21.3	20	15.6	11.7	10
mouth width		15.3	14.1	11.7	8.4	7.1
cut-up		5.1	4.8	3.7	2.8	2.4
Ø	2'	19.3	15.5	12	10.5	9
mouth width		11.4	10.6	6.7	6.7	6.3
cut-up		5.2	4.9	3.8	3.2	2.5
Ø	1 $\frac{1}{3}$ '	15.8	14.2	11.2	9.1	8.3
mouth width		11.5	10.5	8.7	5.8	5.5
cut-up		4.6	4.3	3.1	2.5	2.4
Corneta en Eco	Cornet V					
Ø	Roerfl. 8'	52.8	44.6	33.4	26.7	20.5
mouth width		35	32.4	23.1	18.4	14.6
cut-up		14.3	12	10.8	8.5	6.5
Ø	open 4'	41.9	35.4	27.8	24.2	19.7
mouth width		30.3	26.1	19.5	17.1	14.2
cut-up		9.2	8.2	6	5.2	4.2
Ø	open 2 $\frac{2}{3}$ '	31.6	27.6	21.8	19.9	17.2
mouth width		22.6	19.5	15.9	14.3	11.7
cut-up		6.7	6.6	5.1	4.3	3.2
Ø	open 2'	22.6	19.9	15.3	13.2	9.2
mouth width		13.8	12	9.4	7.9	5.1
cut-up		4.8	4.5	2.5	2.6	2.2
Ø	open 1 $\frac{3}{5}$ '	19.7	18.3	13.5	11.1	9.7
mouth width		11.6	10.8	7.5	6.8	6.1
cut-up		4.2	3.6	2.4	2.6	2.6
Clarin Claro	Trompet 8'					
upper Ø		85	78	69	63	60
tongue width		10.7	8.7	7.8	5.6	5

Pedal Registers

Pipe Rank	C, D, E-B	C	F	B
Flautado	open 16' II			
ø	metal	325	284	195
mouth width		238	208	143
cut-up		67.5	59.5	42
ø	wood	277×250	260×230	235×205
mouth width		250	230	205
cut-up		69	67	59
Flautado	open 8'			
ø		180	138	99
mouth width		131.4	100.8	72.3
cut-up		37	28.3	20.5
Flautado	open 4'			
ø		120	103	64.2
mouth width		87.6	75.2	46.4
cut-up		26	21.8	14.5
Bajoncillo	Trompet 16'			
upper ø		230×228	220×215	124×120
lower ø		26×17	28×22	27×17
tongue width		27.2	22	17.3
Bajoncillo	Trompet 8'			
upper ø		109	96	82
lower ø		22.4	21	17.4
tongue-width		11.4	13	10.9
Bajoncillo	Trompet 4'			
upper ø		78.5	72	71.5
lower ø		15.8	15.5	14.5
tongue width		8.3	8.3	7.2

Notes

¹ A range of 25 notes is incorrectly given here. “De sostenido . . . re” means c#’ to and including d’’, which is a range of 26 notes.

² The Cadereta is the separate division, placed at the organist’s back (Rugwerk or Positiv). There can also be a second windchest for the Cadereta in the main case. In fact, the Cadereta is divided into two sections. Both parts are playable from the same keyboard. The smaller, free-standing part is called in both dispositions “Positivo de Espalda.” The larger interior section is called “Organo Cadereta.”

³ The range of 24 notes is correct here. Instead of 25 notes, as in the Epistle organ, C# is omitted,

making 24 in the Gospel organ.

⁴ In both dispositions, the pedal registers are missing. The construction of both organs makes it unlikely that the pedal registers are later additions. It can be assumed that the omission of these registers was an oversight.

⁵ 1 Vara is 84 cm.

⁶ In view of the sparse documentation, it seems likely that the dispositions given in *Música y Músicos* may also have come from the *Gazeta de México*. The omission of the pedal registers could point to copying from a possibly incomplete newspaper article.

⁷ Possibly a Corneta? (J.F.)

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FIGURE 1.—Epistle organ, choir side, before fire of 1967. (Photo by *Patrimonio Cultural*)



FIGURE 2.—Epistle organ, choir side, after the restoration of 1975–1978.



FIGURE 3.—Gospel organ, nave side, after the restoration of 1975–1978.

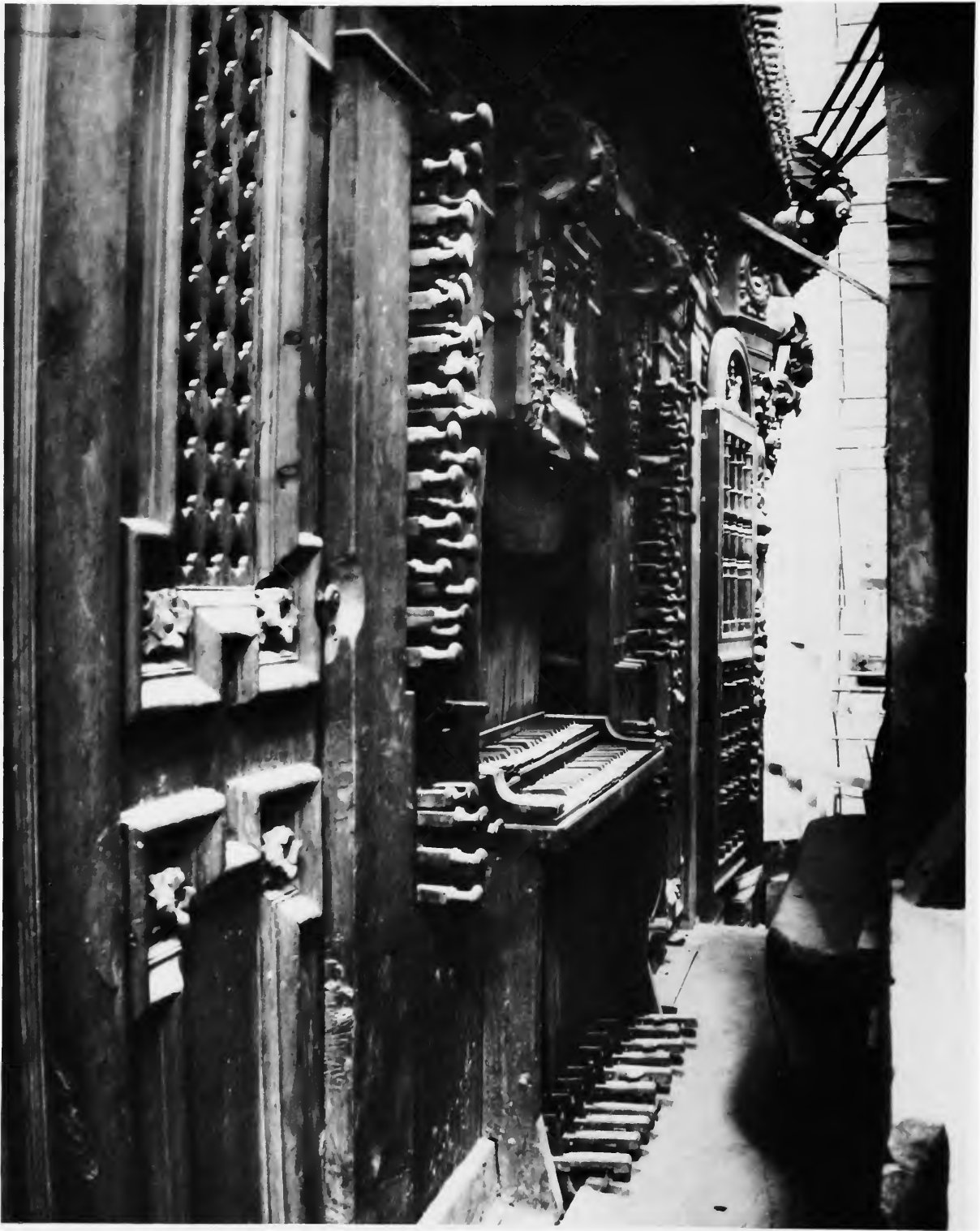


FIGURE 4.—Epistle organ, choir side, keyboards, stop knobs, before the restoration of 1975–1978.



FIGURE 5.—Gospel organ, keyboards and stop knobs during the restoration of 1975–1978. (Some keys of solo keyboard not properly adjusted and register names only partially replaced.)

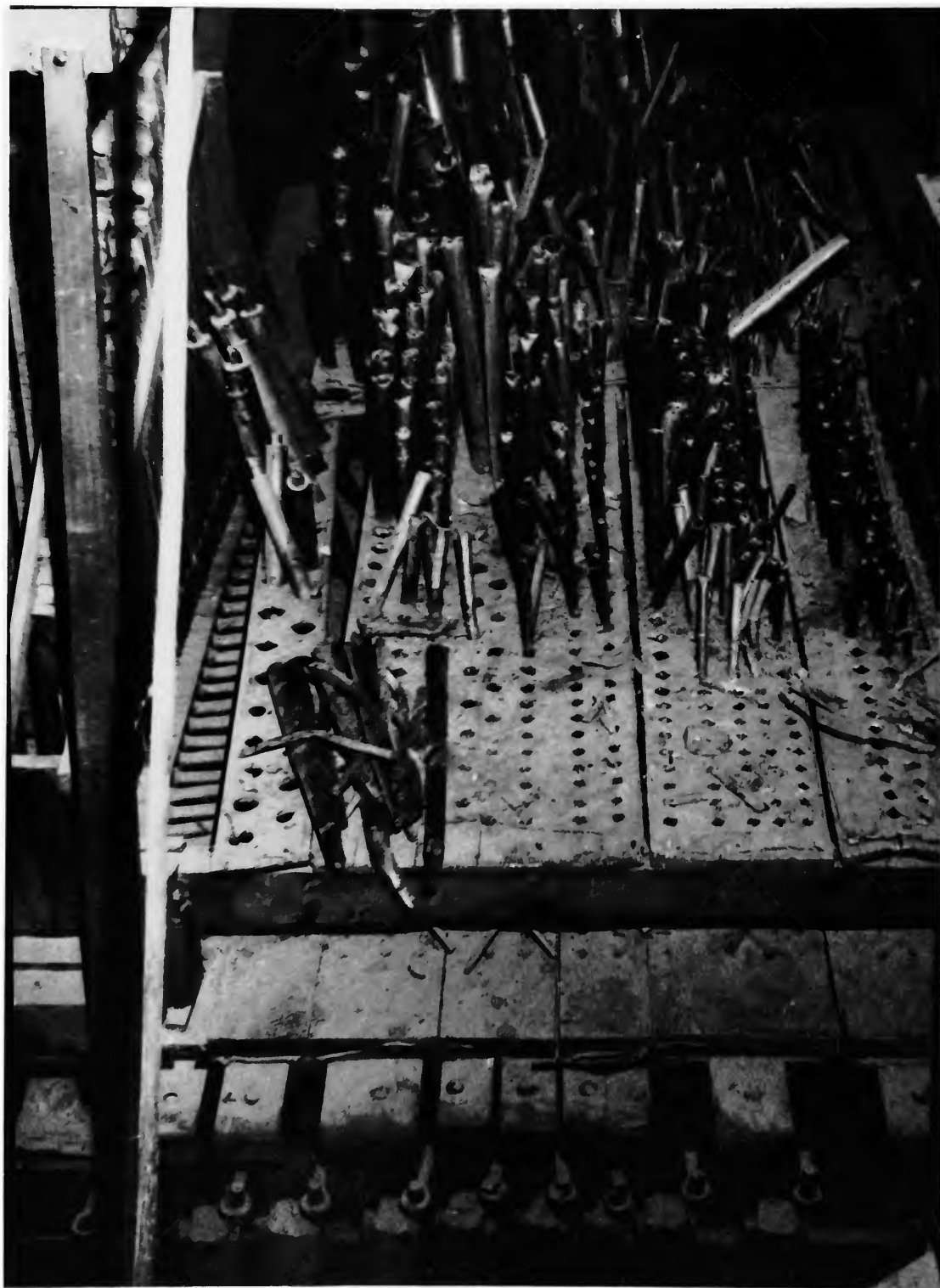


FIGURE 6.—Gospel organ, Main Division, before the restoration of 1975–1978. Ranks (left to right): Flauta traversa (winded by conductors), Espigueta, Tolosana, Octava Clara, Docena Clara, Quincena Clara, Llano, Sobre Simbala, and Simbala.

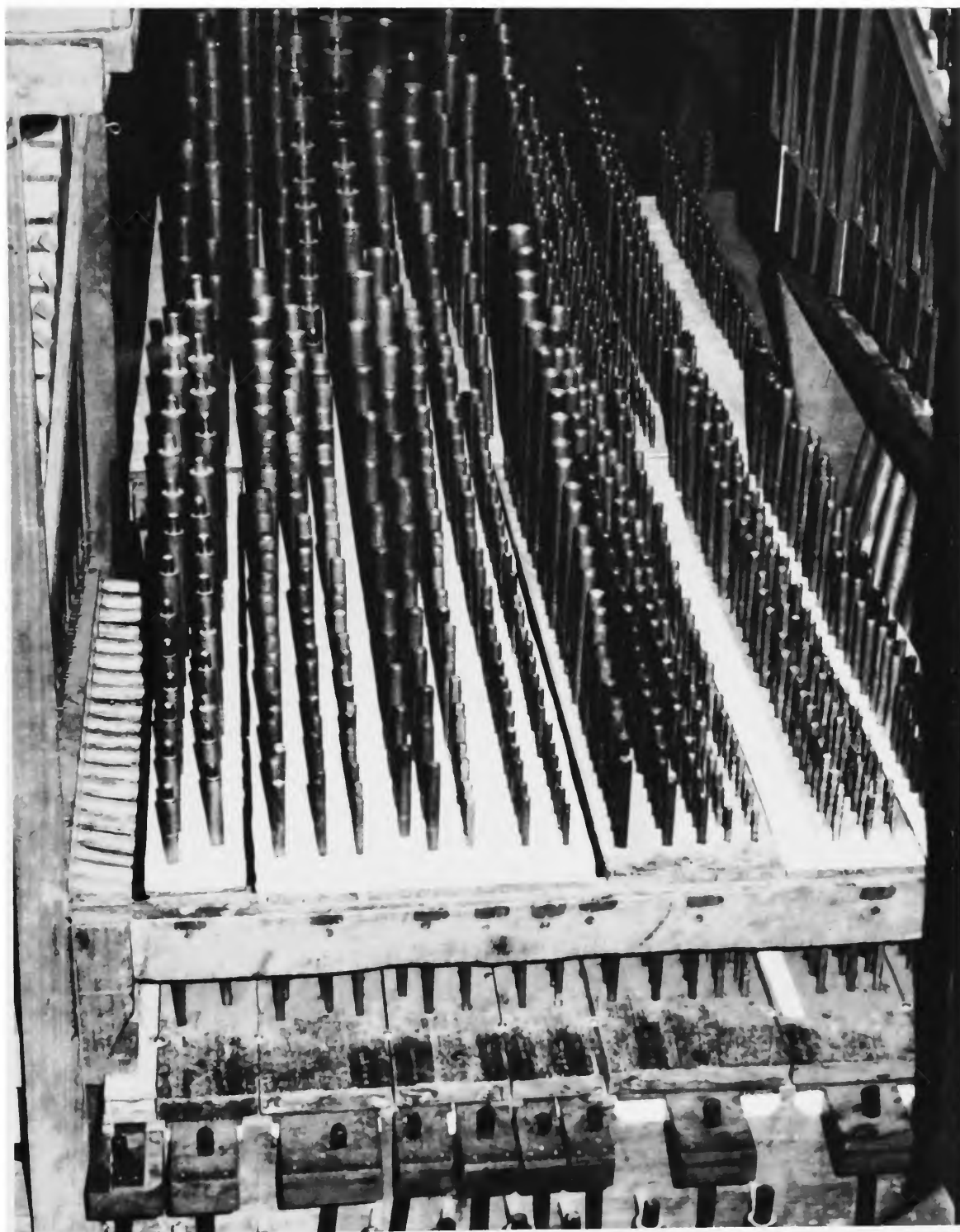


FIGURE 7.—Gospel organ, Main Division, after the restoration of 1975–1978. The same registers as Figure 6. Just visible, far right, Flautado de 26.



FIGURE 8.—Epistle organ, Main Division, before the restoration of 1975–1978. Ranks (left to right): Octava Nasarda, Docena Nasarda, Tolosana, Quincena Nasarda, and Diez y Setena Nasarda.



FIGURE 9.—Epistle organ, Main Division, after the restoration of 1975–1978. The same registers as in Figure 8.



FIGURE 10.—Epistle organ, Cadereta, before the restoration of 1975–1978 shows extensive fire damage.

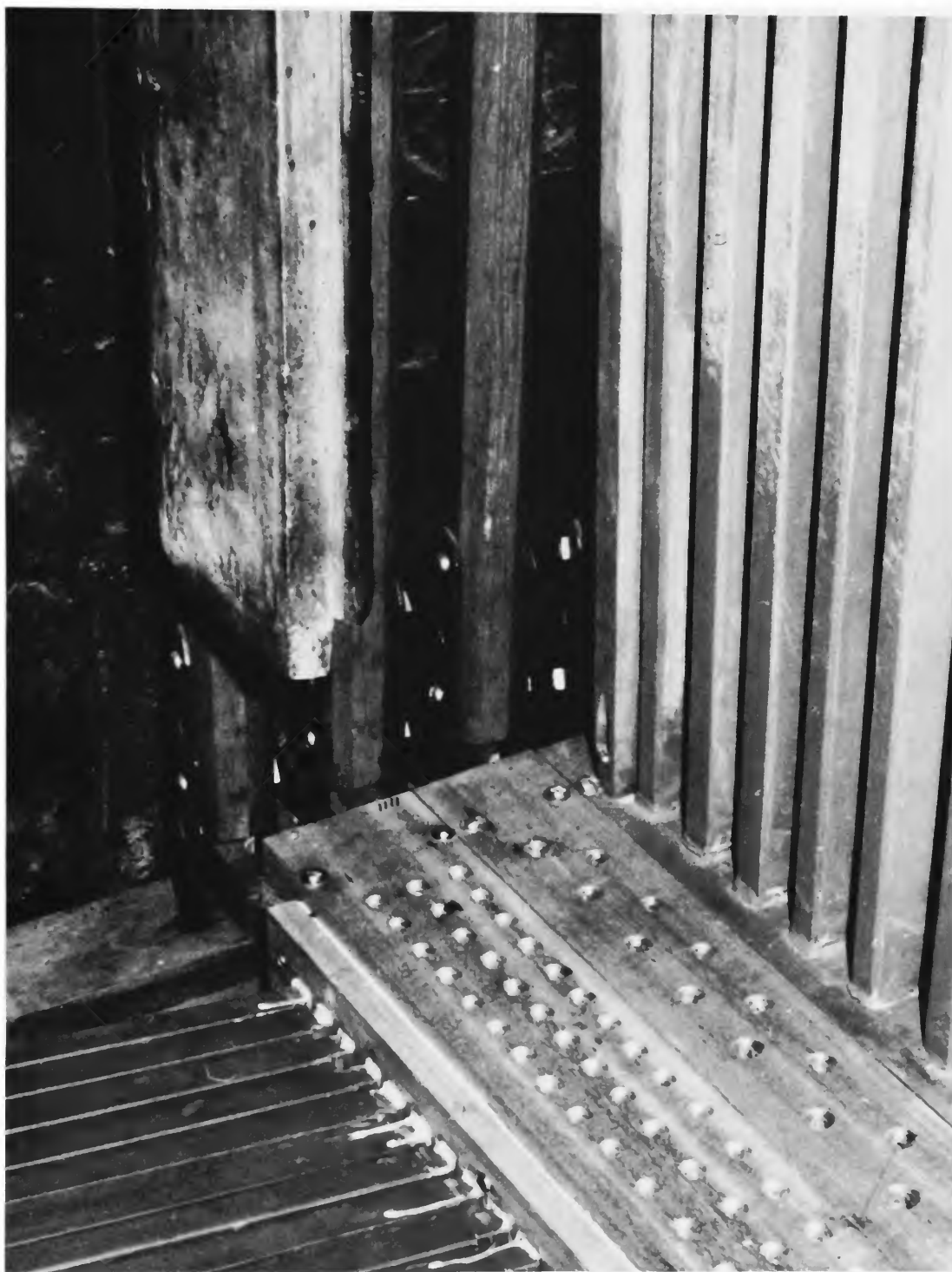
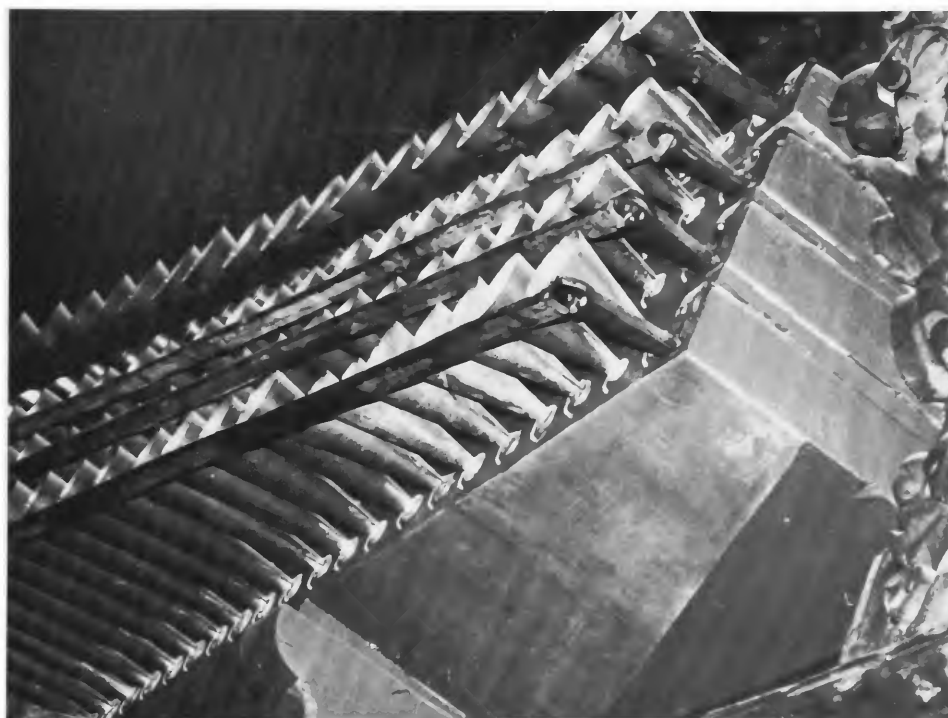


FIGURE 11.—Epistle organ, Cadereta, after the restoration of 1975–1978. Elements (left to right); conductors from pallet box to windchest for Cadereta Exterior; rackboards for Diez y Setena Clara (2 ranks), Quincena Clara, and Fabiolete. Conductors for Corneta Magna above, stop action in background.



FIGURES 12, 13.—Epistle organ, Chamade reed registers: 12 (above), before the restoration of 1975–1978, showing extensive fire damage; 13 (below), after the restoration of 1975–1978. Ranks (top to bottom) are Trompa Magna (treble), Orlo (bass), Bajoncillo (bass), and Clarin en Quincena (bass).



FIGURES 14, 15.—Gospel organ, Chamade reed registers: 14 (above), before the restoration of 1975–1978; 15 (below), after the restoration of 1975–1978. Ranks (top to bottom) are Obue (treble), Clarin de Campana (treble), Clarin de Campana (treble), and Clarin Claro (treble). The treble registers for the Chirimia and the Trompa Magna are placed with the bass Chamade registers.



FIGURE 16.—Gospel organ, action for solo division before the restoration of 1975–1978.

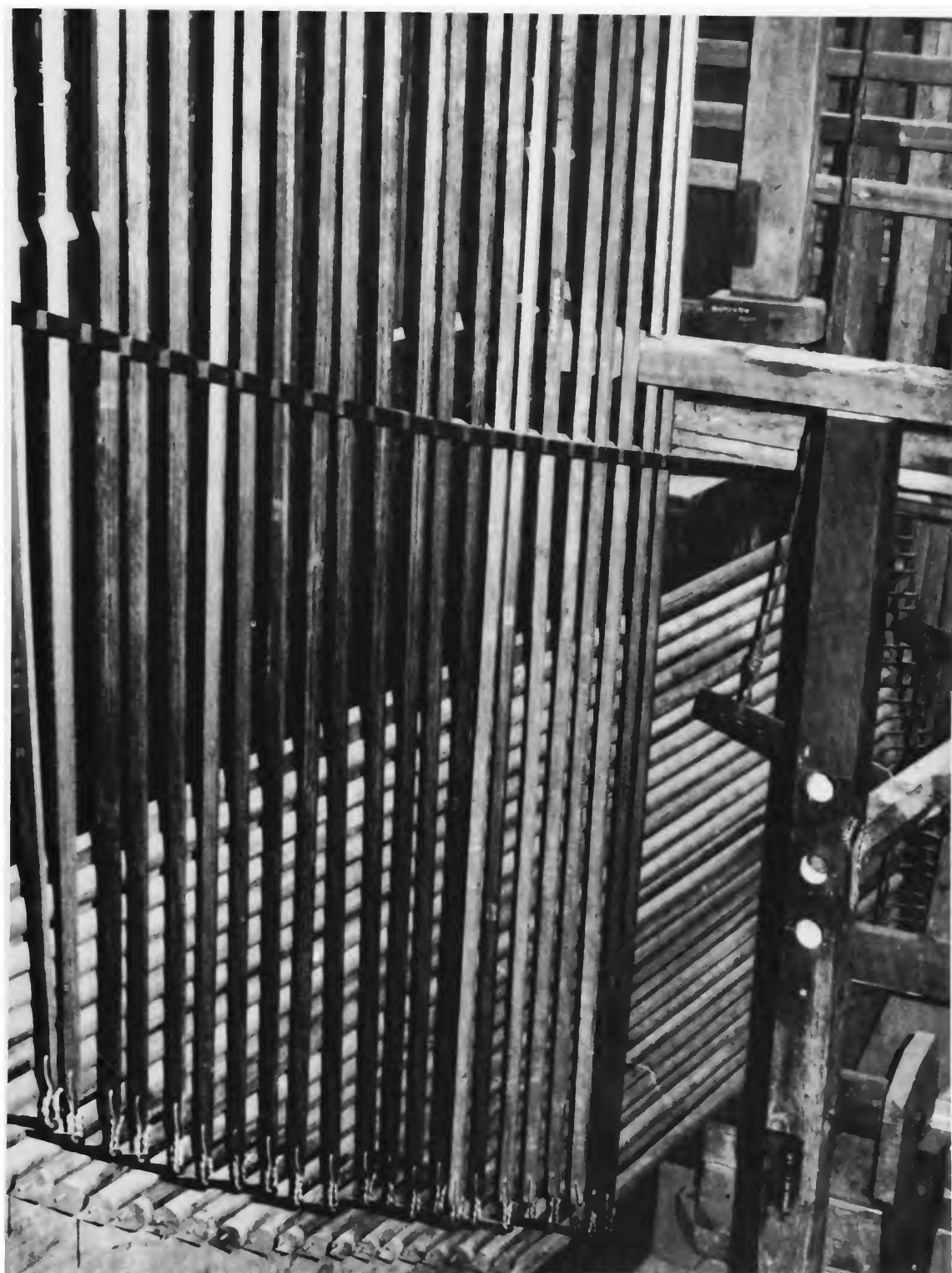
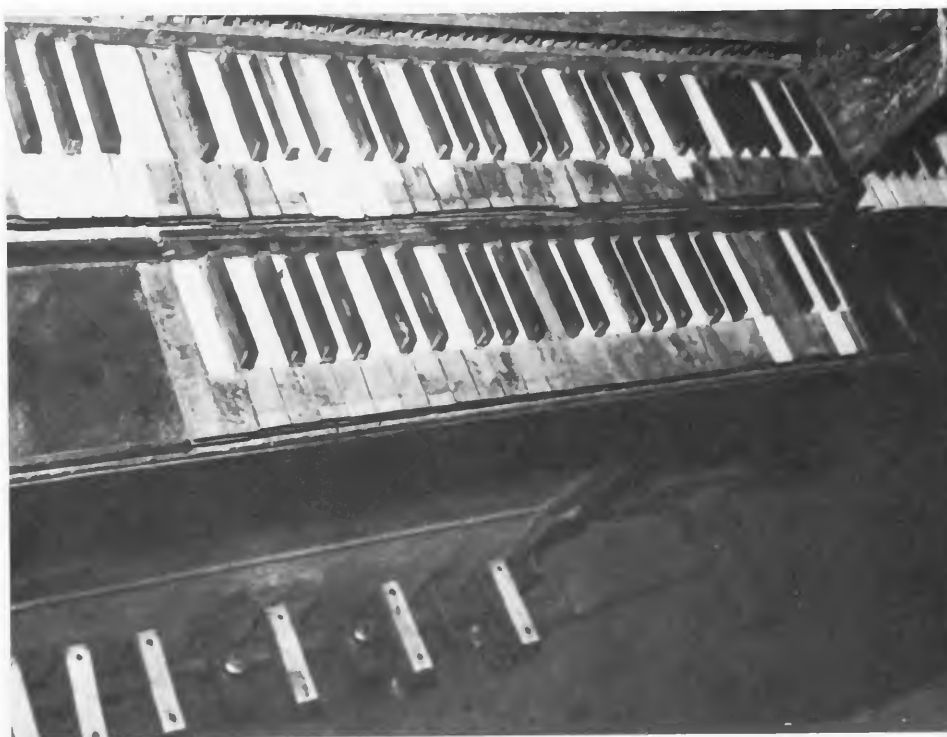
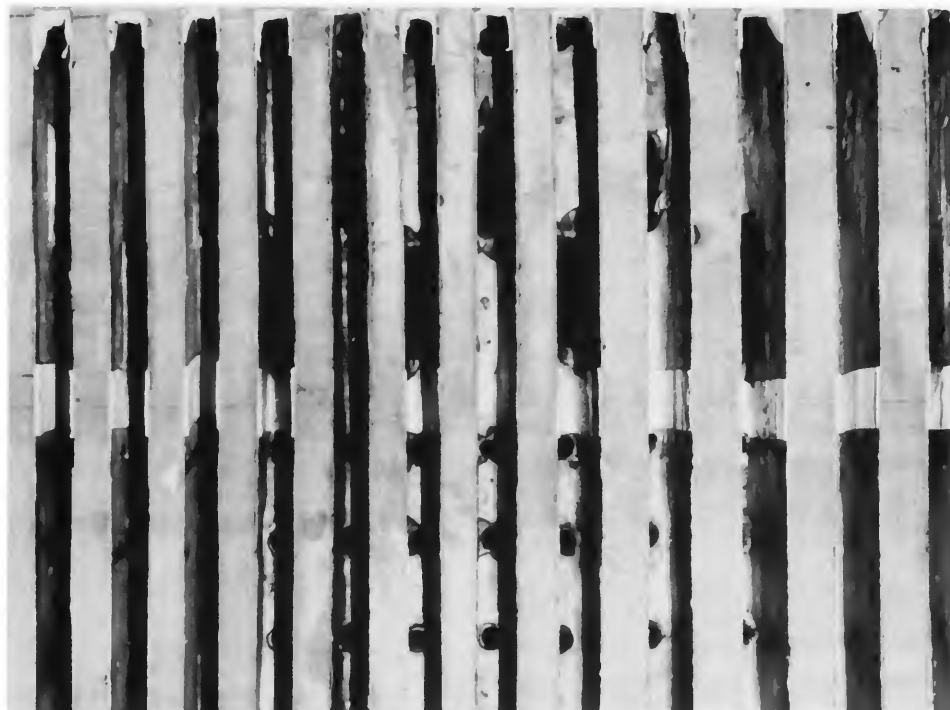
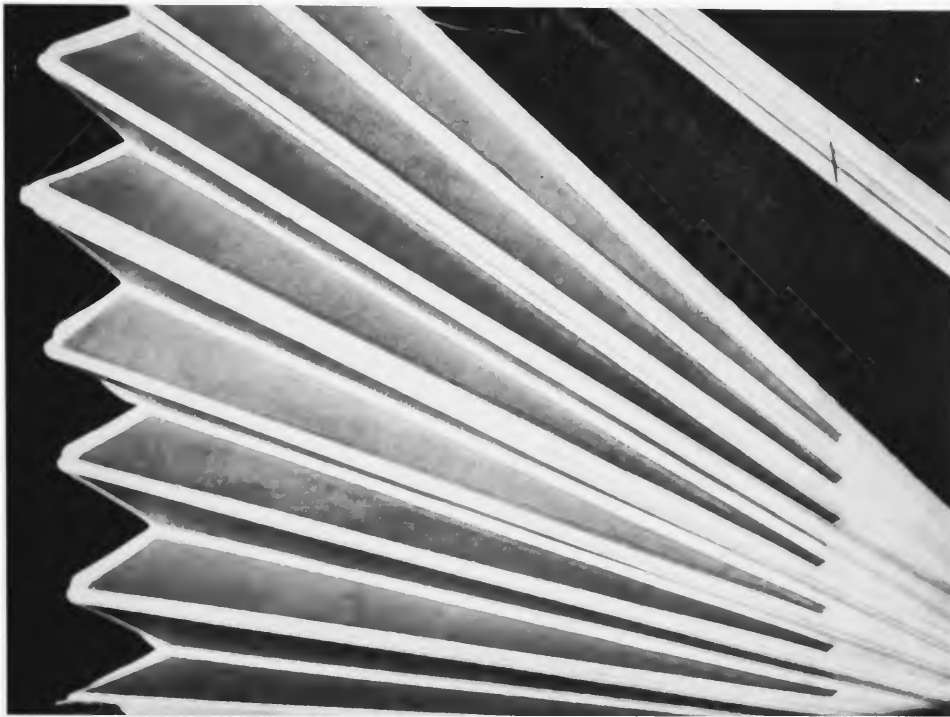


FIGURE 17.—Gospel organ, action for solo division after the restoration of 1975–1978.



FIGURES 18, 19.—Gospel organ, keyboards: 18 (above), before the restoration of 1975–1978; 19 (below), after the restoration. At the left side of the top keyboard (for the Main Division) are the 10 extra keys that correspond to the same pedal keys. At the right side of the lower keyboard (Cadereta), is the keyboard for the solo rank.



FIGURES 20, 21.—20 (above), Reservoir bellows with eight folds and double feeder folds above and below, after the restoration of 1975–1978; 21 (below), Epistle organ, windchest for the Main Division, during the restoration of 1975–1978. Channels carved out of the solid wood; the cracks caused by this construction were made airtight with sheep leather.

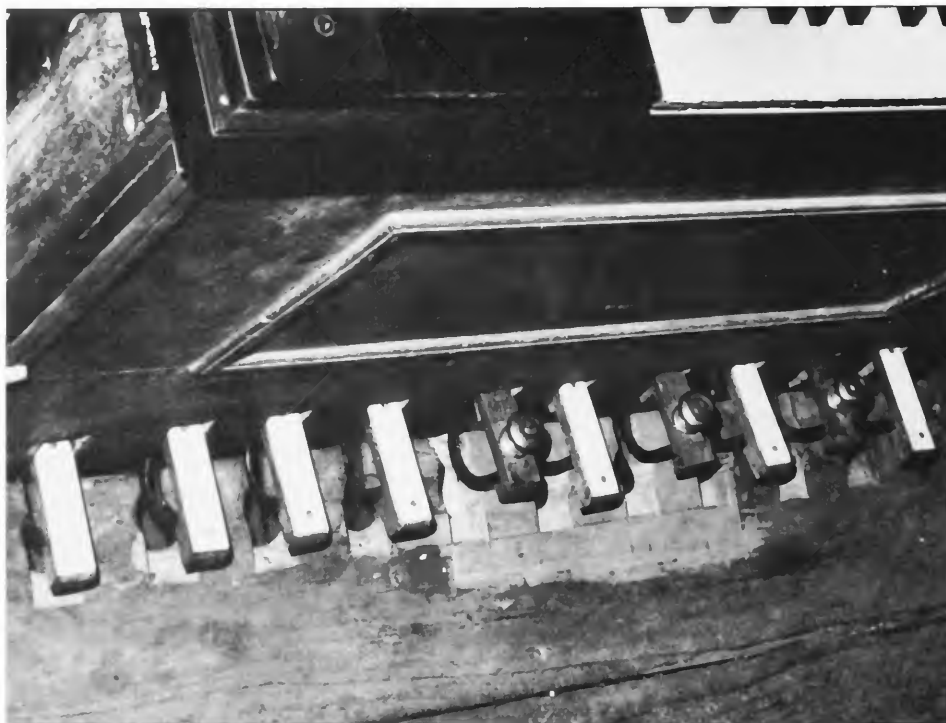
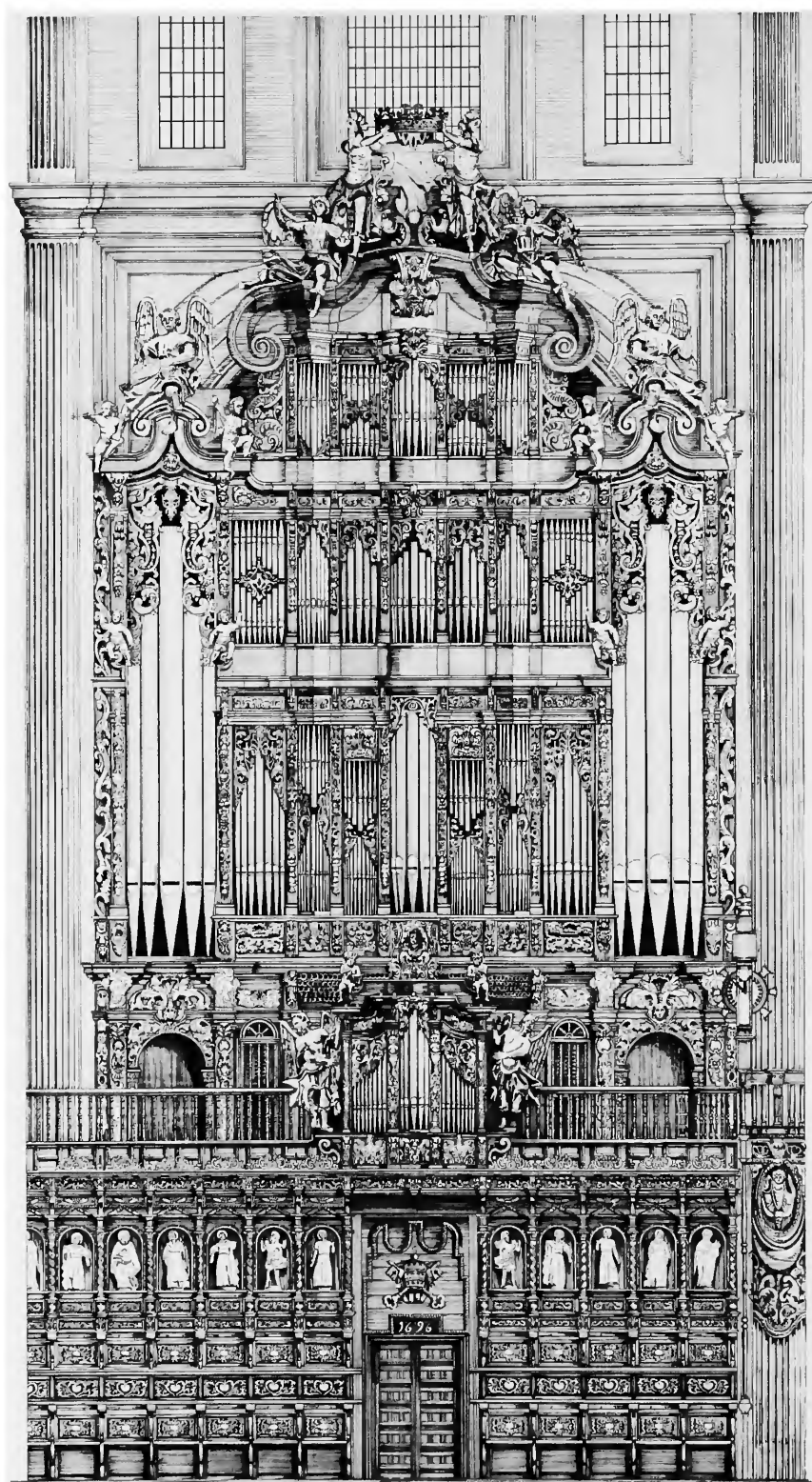


FIGURE 22, 23.—Epistle organ, after the restoration of 1975–1978: 22 (above), Cadereta elements (left to right), interior windchest with pipework, walk board over conductors, conductors from pallet box to interior windchest, pallet box, parts of pedal keys inside case, with trackers for Cadereta keyboard passing between pedal keys to pallet box; 23 (below), Pedal keyboard: C, D, E, F, G, A, and B are covered with ivory; F, G, and A are covered with copper knobs.



FIGURE 24.—Epistle organ, Cadereta, after the restoration of 1975–1978. Visible elements (left to right) are: keyboards for Main Division and Cadereta; pedal keys; conductors from pallet box to exterior windchest; section of floor; and pipework on exterior windchest.



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FIGURE 25.—Gospel organ, choir side. (Drawing by S. Schaper, Flentrop Orgelbouw)

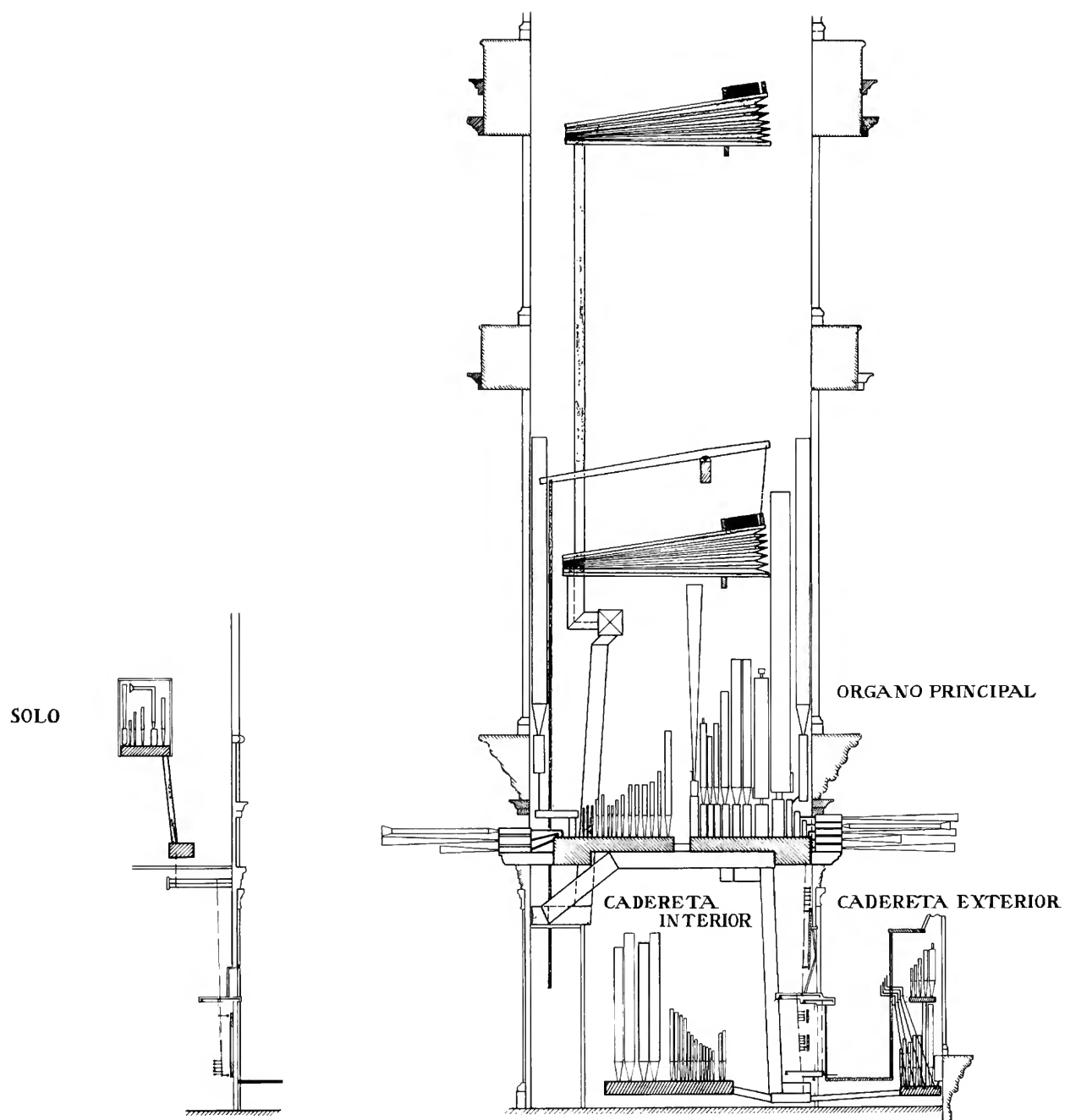


FIGURE 26.—Gospel organ, section. (Drawing by S. Schaper, Flentrop Orgelbouw)

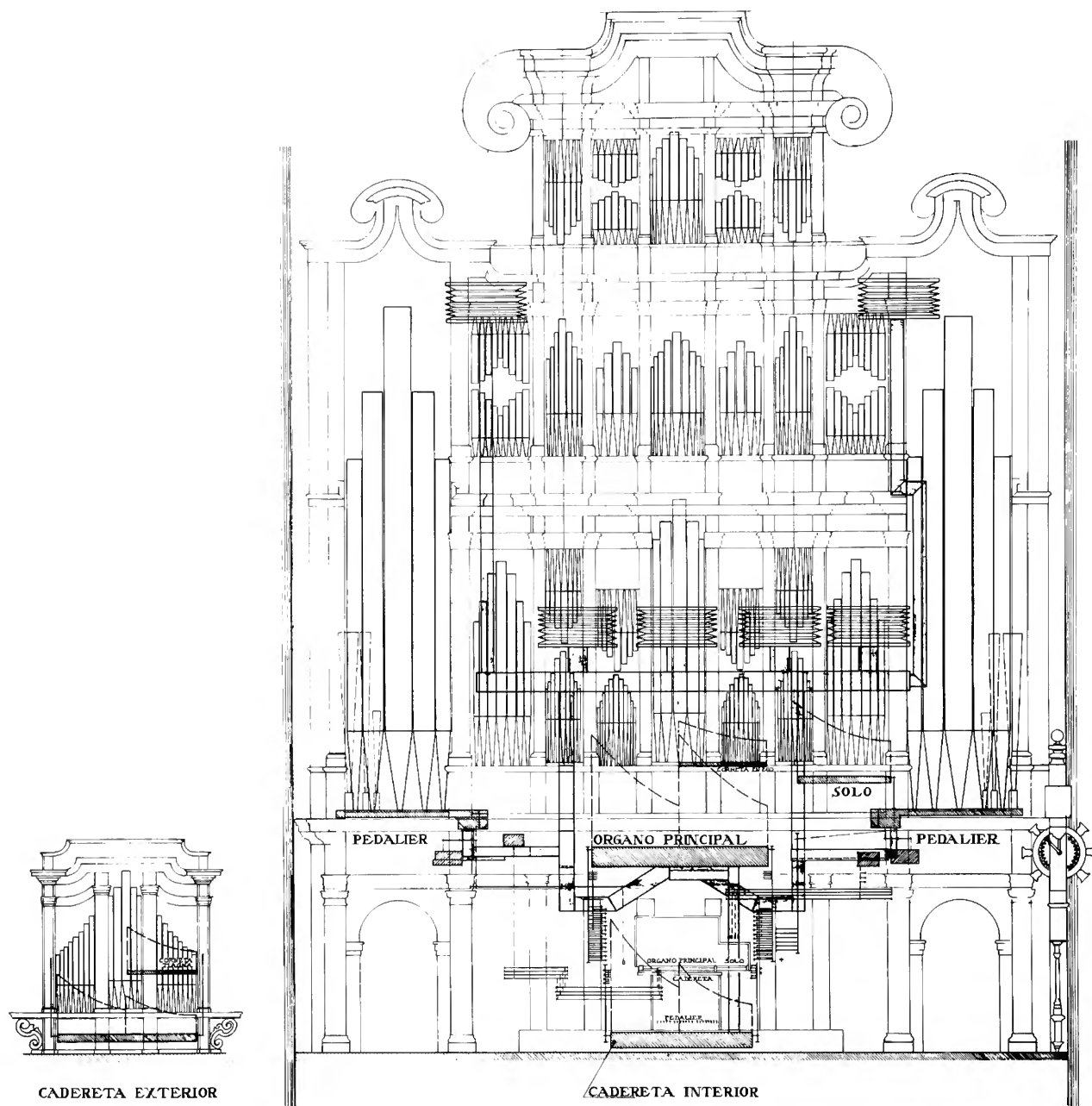
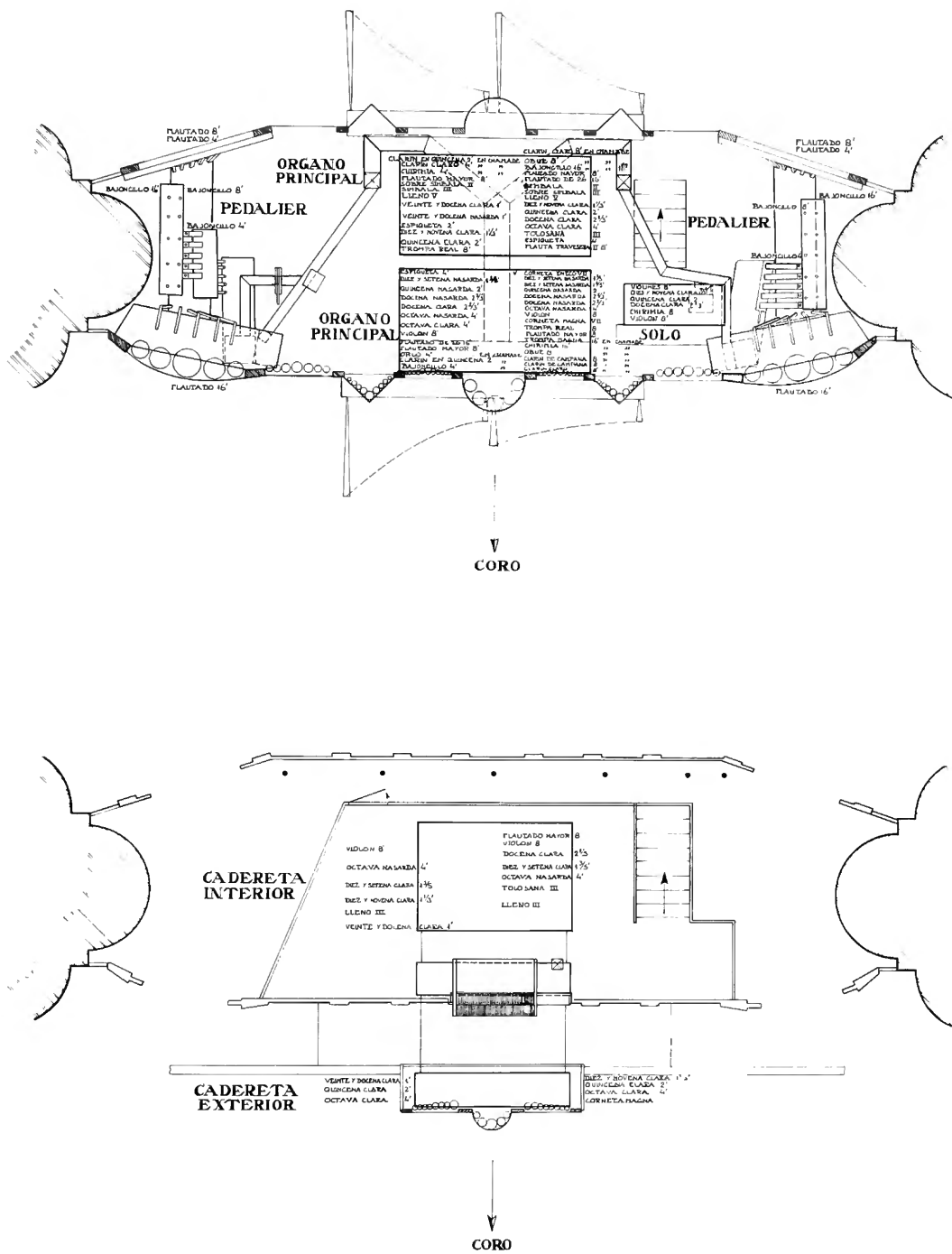


FIGURE 27.—Gospel organ, front view, facade and interior. (Drawing by S. Schaper, Flentrop Orgelbouw)



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