

“Hawaiian Guitar”

—The Acoustic Steel Guitar—

Isami Uchizaki

Preface

Prior to World War II, modern Hawaiian music claimed enthusiastic audiences throughout the world and in fact the sound of the steel guitar is considered to be the most important aspect of the music. The popularity of the steel guitar lasted from around 1915 to the early 1930's and during these years, it was mostly the conventional Spanish guitar which was used for steel guitar playing. The acoustic guitar used for steel guitar playing was called the “Hawaiian guitar”. Before electric pick-ups for instruments were developed at the beginning of the 1930's¹⁾, the steel guitar was an acoustic guitar.

The popularity of the steel guitar was even wider when it was acoustic than after the advent of the electric steel guitar. There were many performers in parts of the world even outside Hawaii²⁾, most of whom had never visited the Islands but were masters of the Hawaiian guitar and released many 78 rpm records. In the age of the standard playing record, the acoustic steel guitar was used in almost every genre of popular music as well as Hawaiian music. In the heyday of the acoustic steel guitar, the place the instrument held in each genre of popular music was more prominent than that of the electric steel guitar. Notwithstanding the versatility of the electric steel guitar, the popularity of the steel guitar has diminished.

Early in the 1970's, there was a general renaissance in traditional Hawaiian culture and Hawaiian people began taking a new look at and studying their language, poetry, history, crafts, music and so forth but not at this musical instrument, which was behind the times, nor its music. Some guitar manufacturers, mostly in the United States, started to market some models of “Hawaiian

guitar” from the late 1910s and they made continual efforts to improve its quality, which resulted in the instrument following a rapid course of evolution in a short period of years.

This article describes aspects of the transformation of this outdated instrument which had such a short life. The article comprises the following chapters:

- Preface
- 1 Introduction
- 2 Origins of steel guitar playing
- 3 Regular Spanish guitar used for steel guitar playing
- 4 Conventional-type guitar specially built for steel guitar playing
- 5 Hollow-neck Hawaiian guitar
- 6 Solid-neck Hawaiian guitar
- 7 Resonator steel guitar
- 8 Conclusion

1. Introduction

During the first fifty or sixty years of this century, one of the most popular genres of American popular music was modern Hawaiian music. While ancient Hawaiian music was the traditional vocal music (chants) sung in the Hawaiian language - the “mele”, either “mele oli” (unaccompanied chants) or “mele hula” (accompanied by instruments and often by dance³⁾ - modern Hawaiian music features the lyrical tones of the steel guitar, played with the clean and brisk rhythm of the ukulele and the regular guitar, and western-style love songs of romance in the exotic land sung mostly in the Hawaiian language. The main characteristic of the music is the steel guitar as the lead melody instrument.

It has been accepted that steel guitar playing was originally invented in Hawaii in the late nineteenth century but there are conflicting claims attributing the invention of the steel guitar playing technique to different individuals. For about twenty years from the invention of the technique in the early 1890's, the guitar used as the steel guitar was the regular Spanish guitar, the instrument laid flat in the lap and played by using a sliding steel bar instead of fingers.

The acoustic steel guitar became remarkably popular in the United States after

the First World War when Hawaiian musical groups started to tour major American cities introducing its characteristic wailing tones. As a result, the tones claimed enthusiastic audiences throughout the country and soon the Hawaiian guitar began also to be used in genres of American music other than Hawaiian music. Its popularity in the 1920's led many guitar manufacturers to produce guitars for steel guitar playing but at this stage the majority were regular Spanish guitars supplied with a conversion kit to convert them to Hawaiian guitars. In using a conventional-type Spanish guitar for steel guitar playing, special adaptations were needed and guitar manufacturers started to market an extension nut for the higher nut, a steel bar and finger and thumb picks for metal strings in a set as “Hawaiian equipment” or “Hawaiian fittings”.

Although it is not possible to identify precisely when, an acoustic guitar made specially for steel guitar playing expressly called a “Hawaiian guitar” appeared around 1915.

The Hawaiian guitar has a high nut and flush frets as its main features and some models have a solid square neck or a hollow square neck. In the late 1920's, a guitar with the resonator built into its body was produced. The Hawaiian guitar had only about fifteen years to live until the advent of the electric steel guitar in the early 1930's.

Although both Hawaiian guitars (acoustic guitars especially made for steel guitar playing) and electric steel guitars are now used, the conventional-type Spanish guitar still continues to be used for steel guitar playing by some players, including beginners.

[A classification of the guitars used for steel guitar playing]

1. Regular Spanish guitar (with nut raised)
2. Guitar made specially for steel guitar playing (“Hawaiian guitar”)
 - i) Conventional type solid neck guitar
 - ii) Hollow neck Hawaiian guitar
 - iii) Solid-neck Hawaiian guitar
 - iv) Resonator steel guitar
 - a. Tri-cone resonator guitar
 - b. Single-cone resonator guitar — “National” type
— “Dobro” type

All these guitars are metal-strung but there are two modes of putting strings on the guitar which are different in mechanical operation and the internal construction of the body and thus acoustical quality. According to the mode, there are two principal forms of the metal-string guitar: the flat-top guitar and the arch-top guitar.⁵⁾ In the flat-top guitar, string ends are attached to the bridge which is glued to the sound board, which thus needs considerable reinforcement inside the body to resist the pull of the strings. Instead, in the arch-top guitar, strings pass over the bridge and terminate at a tailpiece attached to the endblock of the body, where the sound board has only to resist vertical pressure from the strings. This allows a much simpler bracing inside the body than in the flat-top. Most Hawaiian guitars have the former mode and the latter is used for most resonator guitars. In the resonator guitar, strings pass over a bridge held by a support which conducts the vibrations to a thin aluminum cone inside the body.

2. Origins of steel guitar playing

Hawaii has been accepted as the birthplace of steel guitar playing, but as to the inventor of this playing, there are conflicting claims attributing its invention to three different people: Gabriel Davon, James Hoa, and Joseph Kekuku.^{Fig. 1)} Whereas documented sources supporting the claims of the other two are more intriguing but sometimes inconsistent with other facts, the sources for Kekuku can be termed verified and hence he has been most commonly referred to as the inventor of steel guitar playing.

As the objective of this article is not to confirm the source of these claims, it is sufficient to cite the article⁶⁾ under “Steel Guitar” by Helen H. Roberts in the *Bernice P. Bishop Museum Bulletin* 29 titled *Ancient Hawaiian Music*. This is a report of a survey of ancient Hawaiian music conducted in 1923-1924 by Roberts under the auspices of The Hawaiian Folk-Lore Commission represented by John R. Golt, Chairman; Edna J. Hill, Secretary and Emma Ahuena Taylor, Hawaiian member.

“During the years 1893 to 1895, Joseph Kekuku, a young Hawaiian man from Laie, Koolauloa, Oahu, was attending the Kamehameha School for Boys, in Honolulu. The guitar was a popular instrument among the students, who were constantly strumming it. Like schoolboys all over the world, probably, they were



Fig. 1 Joseph Kekuku and a regular Spanish guitar used as a steel guitar.

not unfamiliar with the possibilities of the comb as a musical instrument, and one day as he was playing the guitar the idea occurred to young Kekuku to try the effect of a comb placed on the strings. It is not known just what suggested the thought to him. He was delighted with the result and played with his new toy for a time before it occurred to him to try the back of his pocket knife. This second inspiration was even more satisfactory and thereafter the knife was always used when he played the guitar. However, he wanted a more convenient piece of metal, so he appealed to John Padigan, in the school shop, to fashion for him a piece of steel suited to his needs.

“By this time his singular and beautiful playing had become the talk of the boys, who were all emulating him, and one of them, Tilton, who went to his home on Maui during a vacation, performed on his guitar with the aid of his knife for the benefit of his family. His sister-in-law, now Mrs. Clement Parker of Honolulu,

from whom this account was obtained through the kindness of Mrs. Webb, asked him where he learned to play in such a curious manner and he told her that Joseph Kekuku at school had been the first to think of it and had taught the others how to do it. She later met Joseph Kekuku, who verified the statement.

“According to Mrs. Webb, the fashion spread very rapidly after a concert which she attended and at which, if her memory serves her correctly, Kekuku himself played. The audience was delighted and, as she expressed it, ‘it took the house’, as it has since taken the musical world. This invention of the Hawaiian school-boy is the most significant contribution by Hawaii to music, the introduction of an entirely new technique for the playing of stringed instruments, at least as far as the western world is concerned, although the Japanese employ a similar technique with one of their stringed instruments, and some African tribes north and south of the Congo do the same with the musical bow, using a shell or knife blade.”

3. Regular Spanish guitar used for steel guitar playing

Any conventional-type Spanish guitar that is strongly built can be used for steel guitar playing. As it is played by using a sliding steel bar which presses the strings against the frets to produce the desired notes, it is necessary to raise the strings about $\frac{1}{5}$ of an inch higher than normal, so that the steel bar will not strike the frets when pressing the strings. A nut readjuster was made for this purpose: a U-shaped piece of metal that fits over the finger-board nut of the Spanish guitar, allowing the strings to pass over its uppermost side and rest firmly in the guide notches which are cut there for this purpose. Usually three picks are used: two metal thimbles and one celluloid thumb pick are used in picking the strings.⁷⁾ This special converting nut adjuster, the three picks, and the steel bar were offered by guitar manufacturers in a kit under the name “Hawaiian equipment” or “Hawaiian fittings”. As for the strings, usually metal strings are used as they have a higher tension than gut strings and transfer more strength of vibration to the soundboard (top of the body) and produce a louder sound. The set of metal strings commonly furnished on a regular Spanish guitar are also suitable for steel guitar playing. However, most players replace the 1st plain wire string with the 2nd steel plain wire string, and the 3rd string, which is of the

wound, or wire-wrapped type, is replaced with a plain 3rd string.

The tuning of the Spanish guitar is from treble to bass E, B, G, D, A, E but the tuning for steel guitar playing was not at all like this. Common tunings⁸⁾ which have been used from the beginning are the A tuning or the so-called low-bass tuning of E, C#, A, E, B, E or the high-bass tuning of E, C#, A, E, C#, A, with the lower three wound strings tuned an octave below the first three. There are several views about the origin of these tunings: one is that they were taken from “slack key”⁹⁾ tunings and another traces their origin through a balalaika or a dulcimer to the Indian sitar.¹⁰⁾ The popularity of these A major tunings with Hawaiian steel guitar players seems to be due to the fact that these tunings were suitable for playing Hawaiian tunes.

Some guitar manufacturers of the time, though not manufacturing a special model for steel guitar playing, apparently expected that some of their regular Spanish guitars would be used for steel guitar playing. For example, in *The 1921 Gibson Catalog* of fretted instruments, there are photos in which Gibson Spanish guitars are laid flat in the lap and played in the steel guitar fashion and on several pages showing Spanish guitars, a notice reads “Complete Hawaiian steel guitar equipment furnished free with any Gibson guitar upon order”. In a 1927 Gibson catalog, there are some similar photos and on a page showing a Gibson Spanish guitar, a notice reads “This model is especially good for Hawaiian or steel playing”.

The “Gibson carved-top, style O Special Grand Concert Guitar, Artist Model”¹¹⁾ is a Spanish guitar marketed in 1918 but is known to have been used for Hawaiian music as an acoustic steel guitar. The carved-top Spanish guitar designed by Mario Maccaferri,¹²⁾ who was a concert guitarist and an inventor of steel string guitars was marketed in three models: Classical, Hawaiian and Orchestra.

4. Conventional-type guitar specially built for steel guitar playing

Guitar manufacturers in mainland America started to manufacture guitars expressly named “Hawaiian guitar” for steel guitar playing around 1920. These guitars were, for the most part, identical to their Spanish counterparts of the same style with few notable exceptions.¹³⁾ For steel guitar playing purposes, these guitars were equipped with high nuts and bridge-saddles which have the same height for

treble and for bass strings. The regulation of strings at the nut and at the bridge is entirely too high for regular guitar playing and therefore these guitars are not convertible to regular Spanish guitars. Other changes, which were not always made, are flush frets, a flat fingerboard, and heavier bracing in the inside construction of the body for metal strings. For steel guitar playing, regular frets are not necessary and signs marking the positions of frets on the fingerboard are enough ; and frets are often ground flush and sometimes inlaid with white celluloid or ivory and even painted in white lacquer. Though it is not widely known, the positioning of the bridge was slightly forward of the regular Spanish position. This different position was due to the fact that since steel guitar playing does not noticeably stretch the strings, it is not necessary to compensate for this.

Some of the instruments have a square-sectioned neck instead of a regular Spanish round-sectioned neck. The square-neck is intended to cause the neck of the guitar to rest on the legs more stably when placed flat, whereas the round-neck is especially for the left hand fingering of Spanish guitar playing.

In reaction to the general acceptance of the acoustic steel guitar, most of the famous guitar manufacturers in the United States got involved in the new line but

the volume of demand was quite limited by the nature of the market and, as soon as its popularity diminished, these manufacturers ceased production of the instrument.

Brand names under which the conventional-type acoustic steel guitars were marketed as “Hawaiian guitar” and whose manufacturers have been identified are “Ephiphoue”, “Gibson”, “Gretsch”, “Kay”, “Martin”, “Oscar Schmidt”, “Regel”, “Oahu”, “Paul Summers” and “Hawaiian Conservatory”. Those whose manufacturers have not been identified are “Biltmore”, “Bronson Honolulu”, “Columbia”, “Harlin Brothers”, “Kalamazoo”, “May Bell”,



Fig. 2 “Martin” Hawaiian guitar, a conventional-type guitar specially built for steel guitar playing.

“McKinney”, “Master Tone”, “Grady D. Moore”, and “Supertone”. A three-quarter sized model was manufactured under the brand names “Columbia” and “Oacar-Schmidt”. All these instruments are thought to have been manufactured in the United States. The difficulty of access to non-American sources may be the reason why the author has been unable to find such guitars manufactured in other countries. Many others may have been manufactured, especially by minor or individual manufacturers in such small numbers that they were not found by the author, but he is continuing his research to gain additional examples and insights. Anyway, it is well understood that the number of brands corresponds with the number of performers on the acoustic steel guitar at the zenith of its popularity.

Presently there is a tendency for some models of Hawaiian guitar under the brand names “Martin”, “Gibson”, “Ephiphone”, or “Gretsch” to be converted to Spanish guitars for use by regular Spanish guitar players seeking “unique” sounds and these have become collectors’ items as well as the unconverted models.

5. Hollow-neck Hawaiian guitar

Attempts were made in the construction of conventional Spanish guitars for steel guitar playing to have the guitar project a louder sound and sustain it for longer.

One of the results was the hollow square-neck construction. But precisely when, how or by whom it was invented has not been ascertained. However, there is an assumption that the neck construction was influenced by the neck of European dulcimers like the Norwegian “langleik” or the Swedish “hulme”¹⁴⁾.

In the hollow square-neck (hollow-box neck) acoustic steel guitar, the body cavity extends right up to the head. The hollow-box neck acts like a sound chamber and gives a long sustain which is appropriate for steel guitar playing.¹⁵⁾ However, there is a diversity of views on whether the hollow-neck guitar is louder than a conventional solid-neck guitar.¹⁶⁾

The hollow-box neck, which stems out from the body, is about the same depth as the body. In some models, the body depth is comparatively shallow and so is the hollow-neck depth. This depth of the neck is also appropriate for steel guitar playing: playing the instrument laid in the lap, flat (horizontally) across the

knees.

Fret markers are flush with the fingerboard as is usual on guitars specially made for steel guitar playing. Frets made of white wood are inlaid in the wood fingerboard on most models, while on some, the flush frets are made of white celluloid.

Most hollow-neck Hawaiian guitars are made of koa wood from the Islands: the top, the fret board, the sides and back are all made of koa wood. Koa wood is sometimes called Hawaiian mahogany, and this native Hawaiian wood is also used extensively for ukuleles. As to the tonal quality of the koa wood used for the guitar, the following comments offer somewhat contrasting opinions:

“Koa-wood guitars have surprisingly good tonal properties: koa is quite similar to mahogany in its structure, but produces a guitar with a slightly fuller sound. Martin’s all-koa models are characterized by a bright but rounded sound which is very well suited to fingerpicking styles. The clarity of their sound demands good playing, however, as it tends to spotlight any mistakes.” (Tom and Mary Anne Evans)¹⁷⁾

“Koa is a pretty wood. It has much the texture of mahogany, a lacy cross pattern like curly maple, and sometimes shows a defined long grain that can remind you of rosewood. There was not much to recommend it over mahogany for tone, but it was popular because the Hawaiians used it for their native instruments.” (Mike Longworth)¹⁸⁾

Identified manufacturers of the hollow-box neck steel guitar are Hermann Weissenborn, Chris Knutsen, Groehsl, and Suzuki. There might have been other manufacturers but the actual business names have not been determined, chiefly because the names are not printed on the labels on the instruments.

Hermann Weissenborn worked in Los Angeles as a maker of violins and other musical instruments from 1911-1936. He manufactured solid-neck Hawaiian guitars besides several models of the hollow-neck Hawaiian guitars.¹⁹⁾

Chris Knutsen worked in Los Angeles as an instrument maker from 1920-1929.²⁰⁾ The label put on the inside of the body of the model shown in this article reads: “C. Knutsen, Manufacturer of All Kinds of Stringed Instrumunts 1542 Temple St.” In contrast to Weissenborn, it seems that only a limited number of instruments were marketed in the 1920’s, when he manufactured several models of both the solid-neck and the hollow-neck Hawaiian guitar.²¹⁾

Groehsl was founded in 1890 in Chicago as a fretted instrument maker and was renamed the “Stromberg-Voisinet Company” in 1921 and made the “Mayflower” line of guitars and mandolins, and then in 1931 evolved into the “Kay Musical Instrument Company”. The conventional-type solid-neck acoustic steel guitar was also made under the Kay brand during the late 1930’s to the early 1940’s.

In Japan, around 1935, Suzuki Violin Manufacturing Company, Nagoya, manufactured acoustic steel guitars besides other stringed instruments. The instrument was commonly called a “Hako-gata” (box-shaped) guitar. Since Hawaiian music, especially featuring the steel guitar, was introduced into Japan in the late 1920’s, the exotic sound of the steel guitar captivated Japanese musicians and many learned to play the steel guitar. A few became outstanding Hawaiian steel guitarists by almost any standard. The 1930’s is the era in which Hawaiian steel guitar music became popular in Japan and the hollow-neck Hawaiian guitar was manufactured in the middle of the period under the “Suzuki” brand.

A three-quarter size hollow-neck Hawaiian guitar was manufactured. The body size is about the same as the size of the baritone ukulele or the small-sized tenor guitar. The manufacturer of the instrument is not identified but under the brand name “Hilo”, a three-quarter sized hollow-neck model was manufactured besides the regular sized hollow-neck models. The label inside of the sound-hole on one model reads: “HILO-HAWAIIAN GUITAR Style 0625 Number 1061”. In the early 1930’s, many people learned to play the steel guitar, and music schools that gave steel guitar playing lessons appeared throughout the U. S.. They sold students a course of instruction and some of these schools had a special instrument constructed for this purpose to sell to their students. A three-quarter sized hollow-neck instruction model was also manufactured. On one model introduced in this article, on the paper fret board, fretlines and all the notes are printed, and this model has a unique device. The name of the instrument printed on the fret board is “Genuine Hawaiian RADIO TONE guitar”. By “RADIO TONE”, it seems to indicate the device of a small round tin plate which was placed in the sound hole. This can be termed a primitive type of resonator guitar.

In recent years, the hollow-neck acoustic steel guitar has made a minor comeback, as a result of the search by certain rock artists for a new sound. Ry Cooder, David Lindley, and John Fahey have all occasionally used the instrument

“Hawaiian Guitar” — The Acoustic Steel Guitar —



Fig. 3 “Hilo” hollow-neck Hawaiian guitars. Regular-sized model (right) and three-quarter sized model (left).

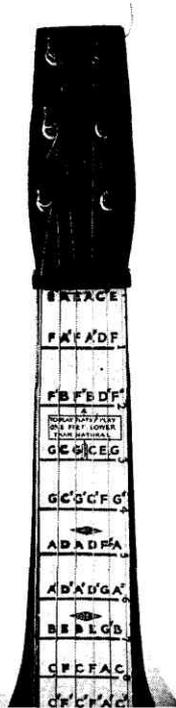


Fig. 4 Fretlines and the notes printed on the paper fretboard on the instruction model hollow-neck three-quarter sized Hawaiian guitar.

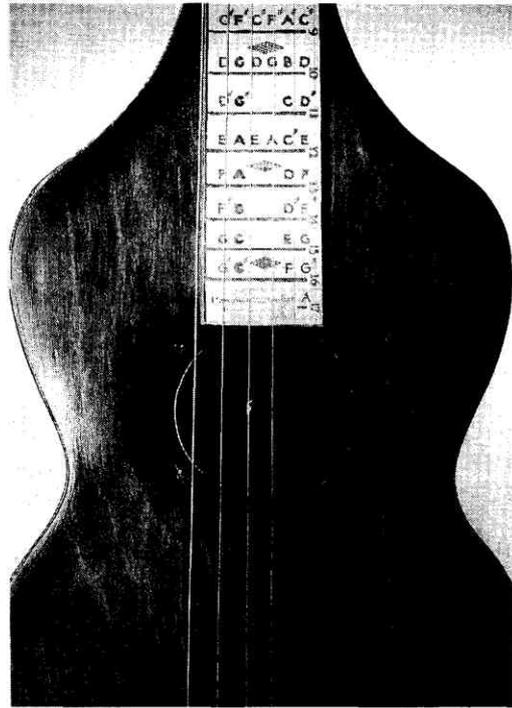


Fig. 5 Tin plate placed in the soundhole of the instruction model labeled “Genuine Hawaiian RADIO TONE guitar”.

on the stage and for recording. However, even when this instrument began to experience a local revival in the late 1970's, most tunes played on the instrument were not Hawaiian and sometimes it was not used for regular steel playing, but was played “bottleneck” style.

The manufacturers are not identified but the hollow-neck Hawaiian guitar was also marketed under the following brands: “Hilo”, “Hula”, “Maikai”, “Lyric”, “A. J. Bush”, “Madonna”, or “Italian Madonna”. Most of them resemble Weissenborn model hollow-neck guitars in shape and construction and it is not surprising that one theory claims that Weissenborn manufactured most brands of these similar hollow-neck guitars.²³⁾

It has not been determined whether it was a result of craving novelty or of seeking economy, but a bizarre-looking model was manufactured. This model is referred to as the “teardrop” model.^{Fig. 6)} It has a bottom-heavy shaping, lacking



Fig. 6 “Teardrop” model hollow-neck Hawaiian guitar by Hermann Weissenborn.

upper bouts. Judging from the manufacturing costs, this model must have been marketed at a less expensive price than models of hollow-neck guitar with the conventional gourd-shaped body. Among the manufacturers are Chris Knutsen and Herman Weissenborn.

Because of the body shape lacking upper bouts, the body cavity is smaller but the tonal quality is almost the same as that of the hollow-neck guitar with upper bouts.

An instruction version of the “teardrop” model was also manufactured. On one model, on the paper glued to the fret board, fretlines and the notes are printed also with the name and address “MUSIC STUDIO 196 So. San Pedro, Los Angeles”.

Recently, several guitar manufacturers²⁴⁾ have produced a hollow-neck acoustic steel guitar. Most models are very similar to the Weissenborn guitar in shape and construction.

6. Solid-neck Hawaiian guitar

The Hawaiian guitar of this type was constructed exclusively for steel guitar playing and has a deeper body and mostly a short solid-neck, either round-sectioned or square-sectioned, which joins at around the seventh fret or a fret nearer to the neckhead. The neck is shorter as a result of the larger or longer shaping of the body.

This type of Hawaiian guitar was constructed exclusively for steel guitar playing and is nothing like the conventional type Hawaiian guitar, which can be restored to its Spanish counterpart if the nut and the bridge-saddle are returned to the normal Spanish position.

The body is made of Hawaiian koa wood or mahogany and on some models has a spruce top. As on most hollow-neck models, there are flush fret markers, frets ground down so as not to touch the steel bar, instead of regular Spanish protrude frets, on the neck. Compared with the regular Spanish position, the bridge-saddle is higher, slightly forward of the Spanish position and placed straight, unlike the Spanish slant position.

Among the brand names are Chris Knutsen, Herman C. Weissenborn, Kona, and Lyon & Healy (“Washburn”), of which more varied models of the Hawaiian guitar including the hollow-neck model were manufactured under Chris Knutsen.

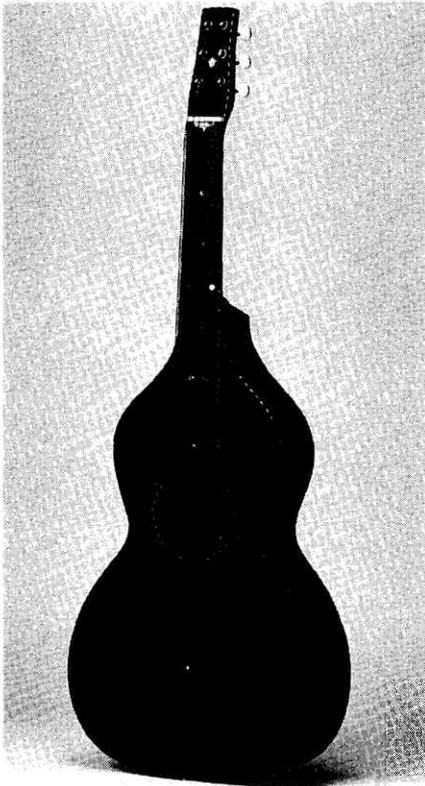


Fig. 7 “Kona” solid-neck Hawaiian guitar.

Lyon & Healy is one of America’s oldest music companies and was at one time one of the world’s largest guitar makers. It was founded in 1864 by Oliver Ditson originally as his Chicago distributor and was named after his associates P. J. Healy, a guitar maker, and George Washburn Lyon, who lent his middle name to their fretted instruments.

As for “Kona” brand solid-neck Hawaiian guitar, the manufacturer is not identified but the label inside the body reads to indicate that the trade name “Kona” is held in copyright by C. S. Delano (Charles S. De Lano), who has been known as Los Angeles music teacher and publisher.

As a result of the Hawaiian guitar attracting manufacturers bent on improving the instrument, there came in models having a larger or longer body and a shorter neck, some without upper bouts, which were pear-shaped or bell-shaped. The length across the lower bout is so long that the player has to have a rather larger lap. Chris Knutsen and Lyon and Healy were the manufacturers.

Other models of innovation are multiple-stringed Hawaiian guitars by Chris Knutsen. One model has the conventional six strings and two additional strings for droning base tones, with harp-type tuners on a wooden handle attached to the upper neck, and another model, in addition to these strings, has four treble strings with harp-type tuners mounted on top of the body. The body cavity on both models extends from the body bottom so nearly to the middle of the neck as nearly to be termed a hollow-neck construction. These models apparently followed the mode of the multiple-stringed Spanish guitar called “harp guitar” which gained minor popularity around the turn of the century and was manufactured by most major guitar makers.

The number of solid-neck Hawaiian guitars produced was far smaller than that of hollow-neck ones.

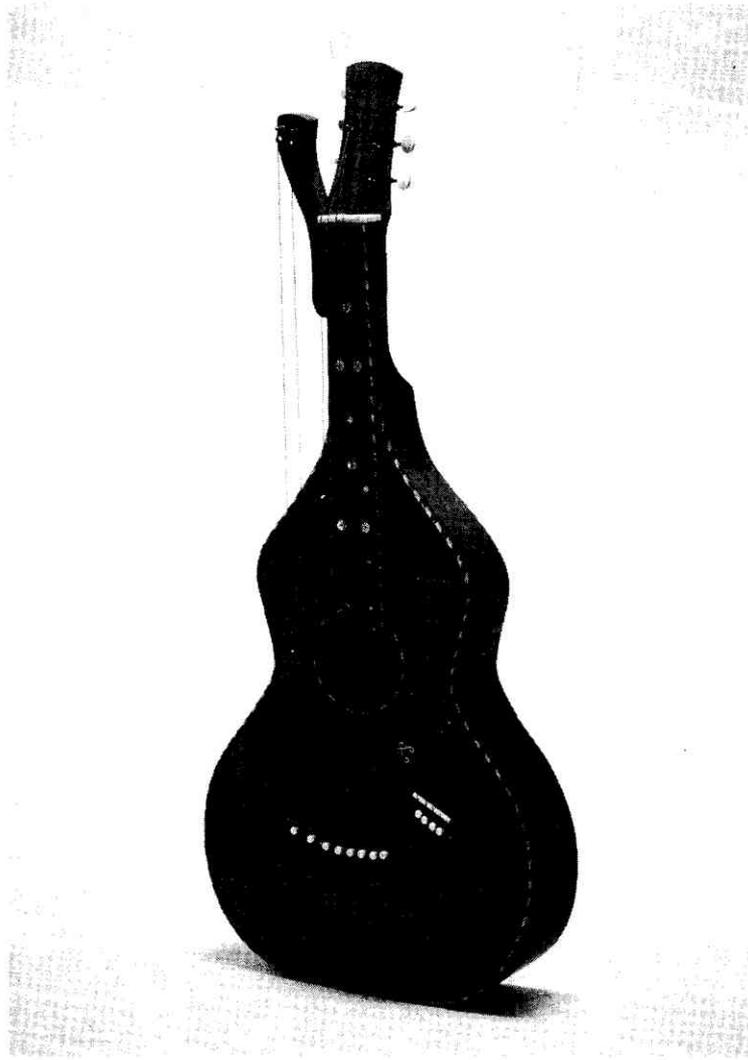


Fig. 8 Multi-stringed solid-neck Hawaiian guitar by Chris Knutsen.

7. Resonator steel guitar

Just before the advent of the electric steel guitar, an epochal acoustic steel guitar appeared that was as different from the conventional acoustic guitar as the electric guitar would be. The new device, just as that in the electric steel guitar that followed, cast aside the preconceived idea that the top of the guitar body must vibrate.

The volume of the sound produced by means of strings imparting vibrations to a sheet of wood that forms the top of the guitar body is quite limited. This is a problem when the guitar is played with other instruments, mostly in small combos with an acoustic steel guitar, a standard guitar and a ukulele, with the

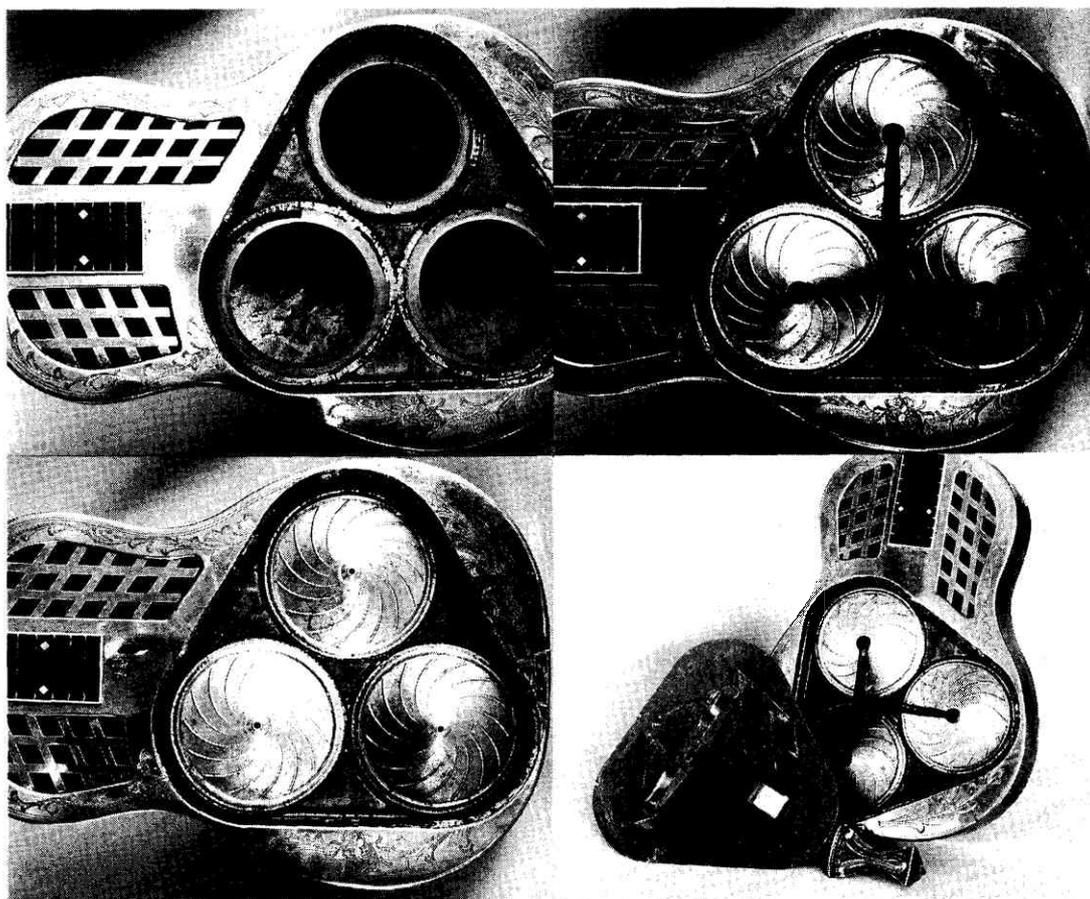


Fig. 9 Dissected “Tri-cone” system on the “National” resonator steel guitar.

addition in some cases of a string bass. With a group of people dancing to the tunes played by such a combo, the steel guitar could not be heard over these other instruments above the noise of the dancers. The quest for greater volume pushed guitar makers to try several new concepts altering their basic designs, such as increasing the size of guitars, enlarging the body cavity by adopting a hollow-neck design, etc.. The most successful would be the electric guitar. On the electric guitar, the strings do not move the top of the guitar body at all but rather move (give an impetus to) a magnetic field on the installed microphone to produce an electric signal. But just before the development of the electric guitar, though not electric-powered, a very similar new device to realize high volume was designed.

The first device was the “tri-cone” resonator system made by John Dopyera, one of six children of a Czechoslovakian family living in Los Angeles, who is generally credited with inventing the resonator guitar. In 1926, he completed the “Triple Resonator Guitar” : a tri-cone system using three 6 inch aluminum cones

“Hawaiian Guitar” — The Acoustic Steel Guitar —

attached to the strings by a T-shaped bridge support resting on top of the cone. The peaks of the cones were joined by the T-shaped bridge support. The three cones were arranged in a triangle, two on the bass side, one on the treble. The string vibrations are transferred to the cones by means of a maple bridge-saddle set into a groove in the cast-aluminum T-shaped bar. Dopyera applied for a patent in 1927 and began production of this resonator steel guitar and marketed



Fig. 10 “National” resonator steel guitar

it under the “National” brand, starting in 1927. The resonator steel guitar was revolutionary not only for its new device but also for its body material and the design of the neck. The body was made of metal: an alloy of copper, nickel and

“Hawaiian Guitar” — The Acoustic Steel Guitar —

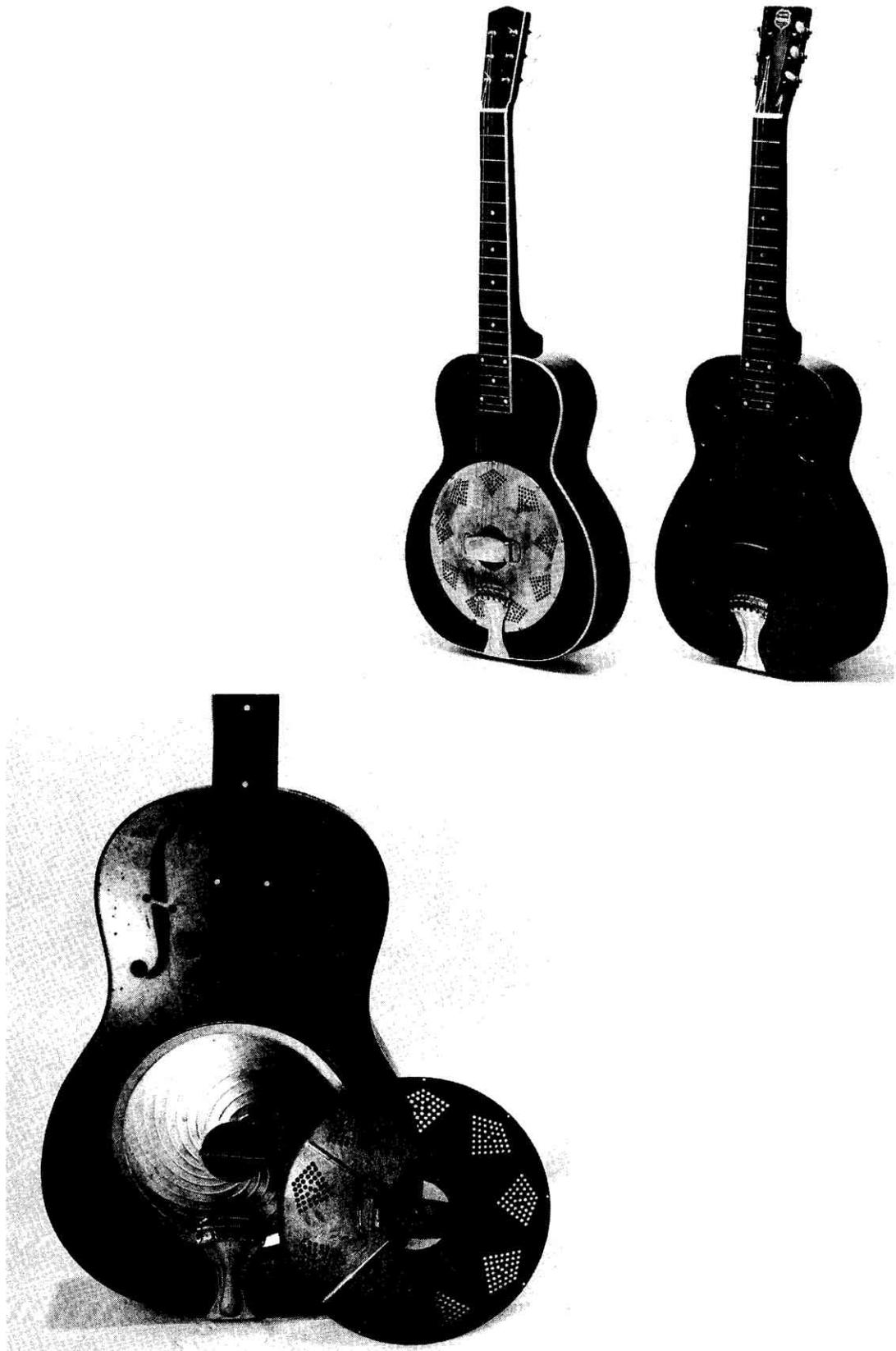


Fig. 11 “National” single-cone resonator steel guitar.
Wood body model (left) and metal body model (right).

“Hawaiian Guitar” — The Acoustic Steel Guitar —

zinc and plated with nickel. The alloy was termed “German silver” or “Nickel silver”. The 1927 model tri-cone resonator steel guitar had a square-sectioned wooden solid-neck. In 1928, conventional round neck models were added to the resonator guitar line. Like most models made for steel guitar playing, they have the neck joining the body at the twelfth fret.

In 1929, a new resonator, simpler in design than the tri-cone was developed: a single-cone design.

There are two types of single-cone design: one was called the “single-cone National” or “single-plate National”,^{Fig. 11)} and the other “Dobro”.^{Fig. 12)}

The single-cone National has one single 9 1/2 inch aluminum cone laid in a prone position in the body, and a 1/4 inch thick “biscuit” shaped maple bridge sits



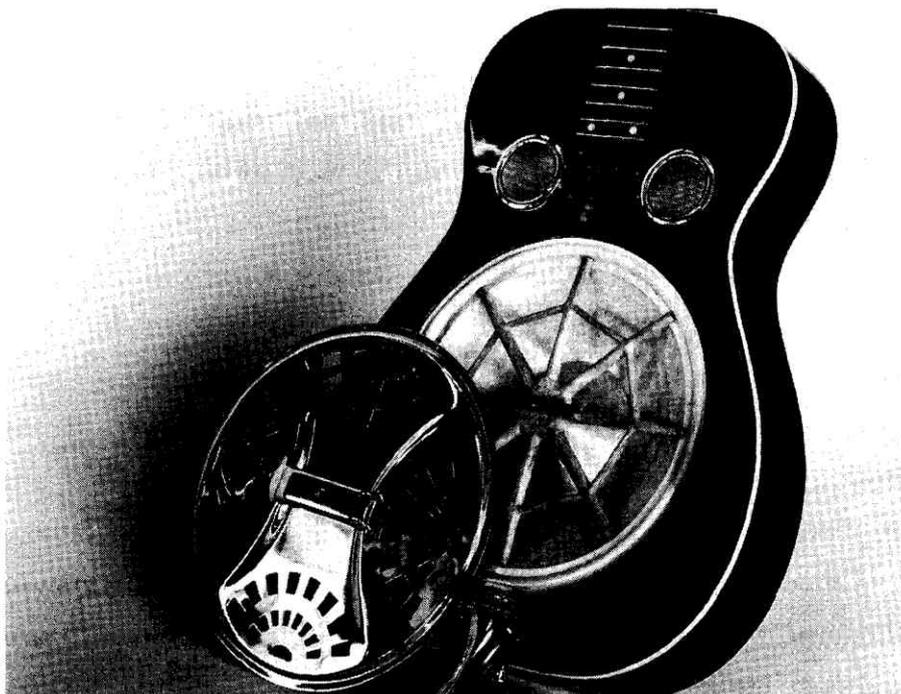


Fig. 12 “Dobro” single-cone resonator steel guitar.

in a depression in the top of the cone. And a saddle is inserted in a slot cut into the “biscuit”.

The Dobro is easily confused at first glance with the single-cone National, but in fact there are fundamental differences in the construction itself. The Dobro resonator has a single-cone, similar to the National’s, but it is dish-shaped, almost the opposite of the volcano-shape of the National, though its center sticks up ; it can be termed something like a sailer’s hat, dipping down around the sides and coming back up in the center, opening toward the top of the body. An eight-armed spider-shaped support which rested on the edge of the cone connects the bridge saddle to the cone. The “spider” is a bridge support comparable to the National’s “buiscuit” which spans the dish and conducts the string vibrations. The “Dobro” has a wooden body and most have a wooden square-sectioned neck although some have a round-sectioned neck.

This single-cone resonator guitar was named “Dobro”²⁵⁾. Dopyera abridged the name “Dopyera Brothers” to come up with the brand name “Dobro” and filed for a patent in 1929. In 1932, National and Dobro merged to become the National and Dobro Company. The two brands jointly owned all the patents for the resonator guitars and shared a factory where they operated like separate companies, each with its own lines of instruments and its own distributors. In 1933,

Dobro granted an exclusive license to the Regal Company of Chicago to make and market resonator guitars under the Dobro and Regal brands.

As replacement parts could be bought from the makers, many minor makers and amateur makers could make resonator guitars to their own design.

The high volume of the resonator guitar was the strong selling point: according to Dopyera, it was seven times louder than a non-resonator acoustic guitar. The single-cone guitars are actually slightly louder than the tri-cones but with somewhat less sustain and with a less sophisticated tone quality than the tricones.

George Beauchamp, a co-worker of Dopyera in the development of the resonator, wanted to give their resonator guitars the publicity they deserved and put a prototype of the tricone steel guitar in the hands of Sol Hoopie, a famous virtuoso of the day, with the result that many other Hawaiian steel guitarists adopted the tri-cones. Among them were Tau Moe, Sam Ku West, Bennie Nawahi, Jim and Bob, David Kane, and Lani McIntire.

Hawaiian steel guitarists primarily stayed with the tri-cone while blues players would prefer the reedy sound and affordable price of the single-cone National and country and western players the Dobro. In fact, it is the single-cone model that brought most success to National and Dobro Company.

Both tri-cone and single-cone systems were also installed in metal tenor guitars and plectrum guitars, mandolins, and both metal and wooden body ukuleles.

The acceptance of the resonator guitar rose and fell in proportion to its popularity in each genre of music but whether it is the National model or the Dobro model is an important factor. The aim of adopting the resonator guitar was to produce increased volume but also to try a significantly different tone quality from other steel string guitars; the tone is different even between National and Dobro models. The National model has been a perennial favorite among Southern blues players and in the 1960's the Dobro model was revived in the enthusiasm for bluegrass music and has ever since shared the stage as a typical instrument in bluegrass alongside the banjo.

In the 50's, more than twenty years after the introduction of the solid body electric steel guitar, a system for a solid body resonator guitar was conceived, although belatedly. This model has a National-type single-cone and has a cover plate on both the top and the back of the body, which allows sound to project from both sides. The nickel cover plates have the usual nine clusters of small holes in

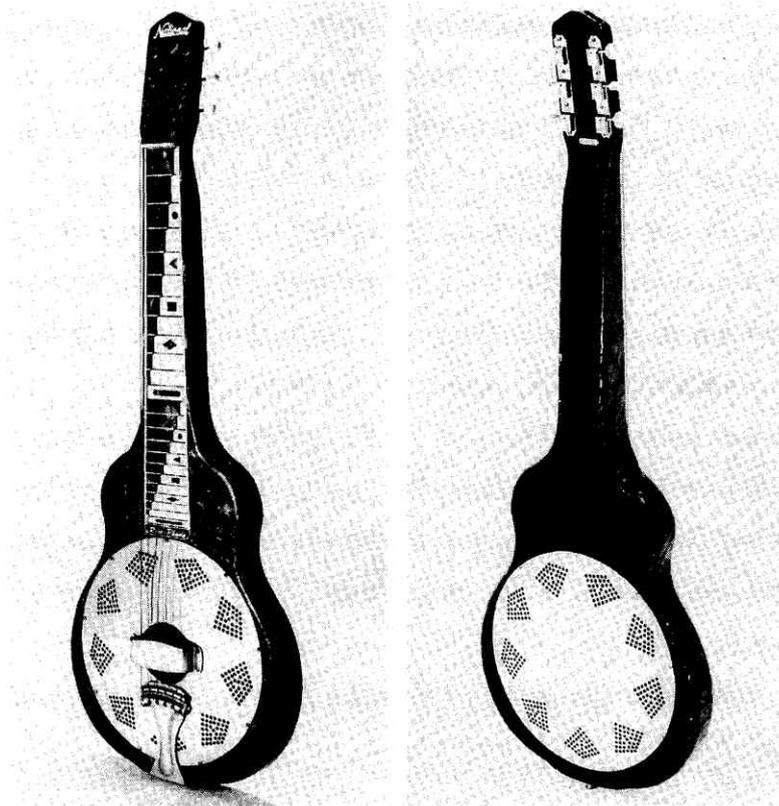


Fig. 13 “National Resophonic” solid-body acoustic steel guitar.

them. The cone is smaller than that of the regular National cone. The entire solid wood body is coated with celloid or paint. The tailpiece is a standard National fan-shaped tailpiece. Models for Spanish playing and steel guitar playing were manufactured. However, in spite of these elements, such loudness and sustain as on the hollow body resonator guitar can hardly be expected from this solid body resonator guitar. In the age of the electric guitar, the demand for this model was quite limited and the production period was only brief. At present, the number of surviving examples is quite small and its existence is even unknown to many people.

8. Conclusion

The foregoing is a rough sketch of the course the Hawaiian guitar followed in its short life of thirty years, which was the result of guitar manufacturers, in their efforts to produce a perfect Hawaiian guitar, working on the problems of amplification and sustaining in different ways. Performers, although feeling the

need for more amplification and longer sustain, tried to select tunes just right for this instrument, to have it sing and to make the most of its characteristic sounds, and this encouraged the manufacturers to keep pursuing their task. This made an epochal period in the history of Hawaiian music.

Descriptions in the article are not complete in details nor are the photos a complete collection of all the models produced by these manufacturers. The author's purpose is to provide an overview and to show these fabulous instruments put out by manufacturers with a progressive spirit.

The Hawaiian guitar has been out of the public eye for a long time but the author would like to see the Hawaiian guitar recongnized once again as an intergral part of Hawaiian muisc, just as the ukulele and even the slack key guitar enjoy that position, not as a refreshing new sound as some contemporary pop musicians see it.

Hopefully, the Hawaiian guitar will make a real come-back and reclaim its rightful place.

FOOTNOTES

- 1) The first electric steel guitar was marketed in 1931 under the brand “Rickenbacker”^{Fig. 14)}. Its circular solid body and neck are cast-aluminum and it had an electric pick-up installed in the body and volume control but no tone control. Because of its shape, it is also known by the nickname “Frying Pan” or “Fry Pan”. Its big sound, tone clarity and long sustainment created a sensation.
- 2) In such places as Indonesia, Japan, Canada, England, Holland, Sweden, and elsewhere in Europe. Mantle Hood, “Musical Ornamentation as History: The Hawaiian Steel Guitar.” *Yearbook for Traditional Music* 15 (1983) pp.144-148.
- 3) Helen H. Roberts, *Ancient Hawaiian Music* (Bernice P. Bishop Museum Bulletin 29.) published by the Museum, 1926, passim.
- 4) The first recording of the Hawaiian guitar in Country and Western music was made in April 1927 by Frank Hutchinson's band, a West Virginian group. In classical music, the “Frasquita Serenade” (“Hab ein blaues Himmelbett”) in the operetta “Frasquita”, which premiered in 1922 in Vienna, is one of Franz Lehar's best-known melodies, and the world-famous concert violinist Fritz Kreisler made an arrangement of it for violin and piano in 1927 and recorded it for R. C. A. Victor, and also later Frank Ferera recorded this melody on the “Hawaiian guitar” with piano for Columbia Records. As to Frank Ferera, see 7.
- 5) There are many fashions in the carving or shaping for the top and each fashion is an important factor in dertermining the tonal quality.
- 6) Op. cit, *Ancient Hawaiian Music*, pp.10-11.

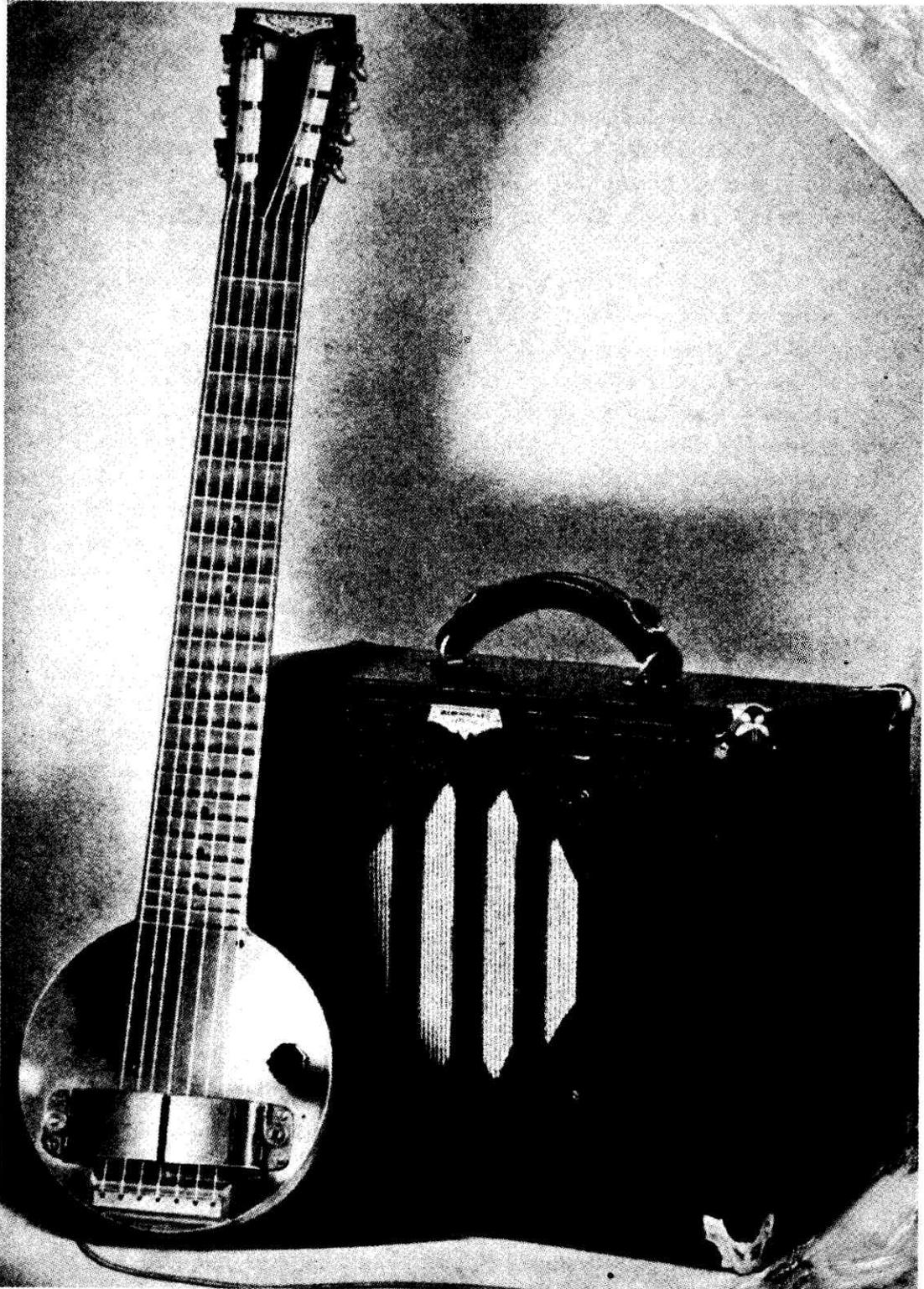


Fig. 14 The first model of “Rickenbacker” electric steel guitar nicknamed “Frying Pan” or “Fry Pan” manufactured in the early 1930s.

- 7) Frank Ferera is the acknowledged pioneer of the steel guitar, soon after its invention by Joseph Kekuku, and is credited with being the inventor of this triple-picking style of steel guitar playing.
- 8) Paul A. Bigsby, 60 *Modern Tunings for Eight String Steel Guitar*. Downey, Calif.: Compiled and published by Paul A. Bigsby, 1956. p. 3.
Robert Gear, “A Brief History of the Hawaiian Steel Guitar and Dobro”, in *Pickin’ Magazine*. Cedar Knolls, N. J.: Colonial Press, November 1974. pp. 12-15.
- 9) Donald D. Kiolani Mitchel and George S. Kanahale, “Steel Guitar” in George S. Kanahale(ed.) *Hawaiian Music and Musicians* (Honolulu, The University Press of Hawaii, 1979. p. 370)
“slack key” refers to the tuning for the Hawaiian style of picking the guitar. The six strings are slackened to basically the pitches of a major triad.
- 10) Kealoha Life, “Dawn of The Steel Guitar”, in *Guitar Player Magazine*. Los Gatos, Calif.: Guitar Player Publications, April, 1972. p. 12. According to the editor’s notes to this article, Kealoha Life is a Polynesian-bred, Hawaiian-speaking steel guitarist. Besides his recordings which include more than 400 titles on 20 international labels, he has contributed to magazines such as *Frets*, *Music Studio News*, and *Banjo, Mandolin & Guitar*. He wrote “The Norwegian langleik and the Swedish hulme, both dulcimers, were often played to the native Hawaiians by visiting seamen. The instruments were played with turkey quills, and were tuned to resemble a balalaika, namely A, A, D. Their two lower strings, A and A, were used as drones like the sitar of India from whence the instrument had already come before arriving in the Caucasus, and thence to Scandinavia. This prompted the Hawaiians to adopt the old A-Major low bass tuning accompaniment of E, A, E. The tuning of the top four strings to a major A chord stemmed from demonstration of a zither by M. Menchen to H. M. King Kalakaua of Hawaii, and from this simultaneously evolved the thumb and finger picks in use today. Equally, no doubt, the neck of the mid-European dulcimers influenced the construction of the ‘hollow-box neck’, native to acoustic Hawaiian steel guitars.”
- 11) Tom and Mary Anne Evans, *Guitars from the Renaissance to Rock*. New York & London: Paddington Press Ltd., 1977. pp. 226-227.
- 12) Op. cit *Guitars from the Renaissance to Rock* p. 227.
- 13) Mike Longworth, *Martin Guitars: A History*. Cedar Knolls, N. J.: Colonial Press, 1975. p. 65.
- 14) See 10).
- 15) Tom and Mary Anne Evans, *Guitars from the Renaissance to Rock*. New York & London: Paddington Press Ltd., 1977. p. 242.
- 16) George Gruhn & Walter Carten, *Acoustic Guitars and Other Fretted Instruments*, Miller Freeman, Inc., GPI Books, San Fransisco, 1993. pp. 150.
“These guitars are pretty, but they are not any louder than a standard guitar, and the major Hawaiian players stayed with a conventional-type guitar, such as Martin”
- 17) Op. Cit, *Guitars from the Renaissance to Rock*. p. 242.
- 18) Op. Cit, *Martin Guitars: A History* p. 65.
- 19) The last business address of Weissenborn was 2434 S. Hoover St. His home was at 311 E. 25th St., Los Angeles.

- 20) Knutsen's last business address was 1306 Mcduff, Los Angeles.
- 21) Ed Dopera, one of the original makers of “National” and “Dobro” resonator guitars, answering to the author's enquiry, wrote: “The guitar you outline in your letter was made in the 1920's by Wiessenborn and also one under the name of Knutsen. Once in a while we came across one of these, however not in these years. They were nice, but no volume. They sold for \$40.00 and up in the 1920's.”
- 22) Haruo Tatematsu, who actually made this instrument about sixty years ago and when the author met him was manager of The First Manufacturing Department, Suzuki Violin Manufacturing Co., Ltd., Nagoya, told about this pet name for the instrument.
- 23) Op. cit, *Acoustic Guitars and Other Fretted Instruments*, pp. 151.
- 24) Among manufacturers or brands are “K & S” (Katechis & Silber), Bear Creek Guitar, John Pearse, John Reuter, Tim Scheerhorn, and “Pegasus” (Bob Gleason) in the United States, Joseph Yanuziello in Canada, “Island Koa” in Britain, and “Canopus” in Japan.
- 25) Among resonator guitars, Dobro commanded such wide popularity that the brand name identified the instrument itself, just as Coke, Jeep and Kleenex do in each field repectively.
- 26) Buck Graves (“Uncle Josh”) is probably the most influential player of the bluegrass dobro whereas Pete Kirby (“Bother Oswald”) and Shot Jackson are masters in the genre of Country and Western music.
- 27) The five-string banjo, acoustic guitar, flat mandolin, fiddle bass and dobro form a typical “bluegrass” instrumental lineup, where the word dobro is not capitalized. The bluegrass dobro player usually plays the dobro standing and holding the instrument from the shoulder with a strap.