THE COULTER

MANDOLINS AND GUITARS

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When Queen Elizabeth used to assuage her maidenly grief over headless suitors, she took her long necked lute and gently strummed a sonnet, to Walter or Raleigh or what's-his-name, on the great-great-great grandmother of the modern mandolin; but, of course, she did not know that she was really doing anything like that, which could be used by posterity for some purpose. I reckon if she had she would not have done it. How was good Queen Libby to know that the soft tongued Latin races would take up her long necked lute and make it the instrument of their master passion. (The modern Greeks, Bulgars, and Serbians have her lute exactly as she used it, even to the strings of gut wound around the neck, instead of wire, for frets, and the extraordinary back bent head that gives you a "crick" in the neck to even look at it.) But the Italian and Spaniard must have sharper sounds. They do not enjoy gutterals or mezzotints, so they shortened up the neck of the Maiden Queen's lute until it was the length of their beloved violin, and the mandolin was born, such as it was, crude, weak, powerlesss up to within a score of years ago.

With the broadening of the musical mind and the raising of standards, there came a demand for lead instruments that did not require so much time to master. The mandolin and guitar were lifted out of the realm of folk-lore and became real musical instruments.

About twenty years ago the mandolins used to come into the shop in flocks of fifty or more to know if we could not put more tone in them, for the schools and their pupils. Inasmuch as some people were spending their good money for music that was bad, a fierce demand arose to make it good. Into that demand, about the time of the Lewis & Clark Fair, we went with all our mind and heart and skill, only to be baffled at every turn, since every effort to improve the mandolin or guitar tone, only made it merely loud or tubby and empty without in any way improving its musical quality.

This was necessarily true because we, like the rest, reasoned that the mandolin and guitar were the same as the violin, and tone must be gotten out of them by some kind of gradation of the sounding board. Since the nearest parallel for the violin was an archer's bow—the fiddle being a con-

trivance to shoot air—so it must be with the mandolin and guitar. (Some large manufacturers in the East are today working upon this basis.) Their product is really not a mandolin at all, but a highly amplified pizzicato tone of the violin. To produce the amplification they increased the weight of the strings and raised the height of the bridge until the whole instrument is almost unplayable. (It is as if you tried to put a piano into a mandolin box or a steam calliope into an accordeon.) Finally, after many failures, we came to see clearly as in a vision that the mandolin and guitar were not to be improved upon the same basis as the violin, and for a very simple reason. The tone of the violin is drawn out by a bow drawn across the strings, which has behind it the muscular power of the whole arm and body of the performer, and is sustained ad infinitum at the performer's will, while the mandolin has behind it for tone purposes only the relatively weak muscles of the wrist, and that for the hundredth part of a second, through the medium of a plecktrum or pick. Manifestly, what would constitute a very brilliant violin would be so lifeless and slow that as a mandolin it would be a dead failure. As noticed in the pizzicato notes of the violin, a good violin would be a mizerable mandolin or guitar. Neither could this fault be remedied by any form of higher graduation of the sounding boards. There was another condition that was puzzling, which was the tendency of the instruments when we had gotten them overstrung sufficient to give the quantity of tone necessary, to produce false tone, or over tones as they are called—really harmonic tones. Now as a matter of fact any over tone whatever is an insurmountable obstacle in a perfect instrument. The well known wolf tone of the violin is a good example; it is produced by the harmonic sounding at the same time as the stopped tone and the effect is paralyzing to anything like pure music. Do not be deceived by any soft words of praise for over tones, as there are some doing at this time. We once knew an organ builder that developed a bad harmonic in the tone of some of his pipes and he finally tried to persuade himself and the friends that were buying the organs that these overtones or harmonics were just the thing that they wanted. However, when the fault was pointed out to him; that the overtone was caused by the shape of one of the orfices that particular shape disappeared, sudden like, and with it went the overtone that had been one of the talking points up to that time. So we found that the more we overstrung the instrument, the worse the over-tone became. Clearly, then, the only remedy was to build into the instrument stress and strain in the fibre of the wood itself so as to increase the resiliance and responsiveness to twenty or thirty times the amount necessary for a violin. To do this was the problem.

The Coulter Super Mandolin

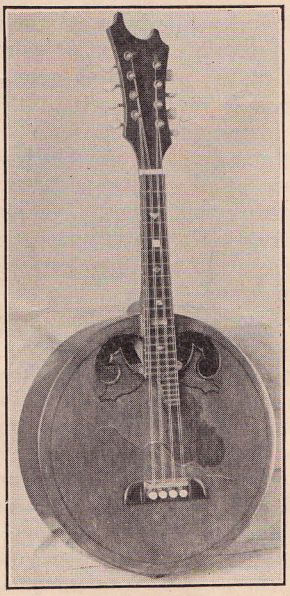
In rebuilding the tops of old mandolins and guitars there was always one difficulty: A weakness of the tone. It was as if you set a tall wobbly pole up, or a flat piece of sheet iron, and tried to make it stand erect. It

would not stand. Neither would the tone stand. It seemed to fall over on itself or wobble, so that while loud enough it had no power. Finally, after repeated experiments it was noticed that the space above the sound hole of all instruments did not vibrate with intensity of the space below, which was so because the cutting away of the fibers to make the sound hole weakens the whole top right in the center under the strings where it needs to be strongest. (There has always been two theories about building instruments; The one that the vibrating string agitates the air through the sound hole and hence produces the tone; the other that the string vibrated the sounding board which vibrated the air inside the instrument and thus it escaped in pulsations through the sound hole. European instruments are nearly all built on the first theory; American instruments on the latter.) So, being American, inasmuch as the air pressure in the body would be equal over the entire surface, it did not matter where the sound hole was placed, we decided to move it to the extreme upper end on each side of the fingerboard where it would use up the least possible amount of valuable fibre and at the same time give a continuing brace from the neck to the bridge. This determined, the form of the holes must also be determined. Here came a memory of our youth while experimenting with organ pipes. We observed that the weak wavy spiritless tones of the pipe could be made firm and solid by corrugating the orifice of the pipe like a piece of corrugated iron. Presto! We curled the sound hole up in a scroll like a rolled up piece of sheet metal, or like the violin sound hole, instead of leaving it round, and the wobbly sound was gone. Even the tone of old guitars stood out solid and stiff. But when we had progressed thus far we still, had to deal with more of the overtone trouble, that is, the harmonics would still sound as we tried to hold the pure stopped tone. Finally we decided to try the experiment of changing the form to see if by chance that would not eliminate the trouble. To this end we made a great many blue prints of the nodes of the various tones and made a discovery; the form of the sound pulsations were invariably like a wave caused by the fall of a pebble in the water, going out towards the edges in concentric ringe. Eureka! Perhaps it was the irregular form of the instrument that caused the trouble, by causing certain sound waves to interfere and thus have two coalesing produce a third that was out of harmony. From these experiments came the round form. The perfectly round form was chosen because where wood is put under great stress and strain it is hard to homogenize its vibrating conditions except in the true circular form, as little

The Coulter Guitar
Style C. 16-inch

corners and hollows produce echoes and false tones. Besides, it gives more neck room and so is correspondingly easier to play and easier to handle.

There was still a most puzzling problem to be solved that is common to all fretted instruments, which was how to get them in tune with themselves—a universal fault, since the geometrical theorem that the shortest distance between two points is a straight line has to be constantly encountered. If the instrument is tuned in fifths on the open strings, when you press down the string to the fret you tighten it and make it too sharp because you make it a bent line; and worse, as you come up the finger board this tension increases to about the twelfth fret and then remains stationary to the twenty-third or twenty-fourth fret, so that if you set the instrument in tune on the twelfth fret, it will be too flat all below, and if you set it for the open strings it will be too sharp all the way up. The way all instruments are now ordinarily set is to have them a little too flat at the lower end and a bit too sharp at the upper end, and so trust that the ear will not detect the inharmony. (In this connection it might be mentioned that all pianos are tuned a trifle flat, since when the hammer lifts the string the pitch is raised ever so little, due to the bending or forcing the string out of a straight line.)



The Coulter Mandolin Style B, with Guitar Bridge

About the time this problem came to a climax we accepted an order to build a very special, valuable and odd-length German Zither, and the finger-board had to be made. In this case, as always, "Man's extremity" proved the real opportunity, for we had to stop and invent a tool to do the work with, which we did by the help of a friend who was a cunning worker in steel, and then to make the situation complete, we discovered that we could make one tool in which allowance would be made for the pull of the string, to set the first octave or twelve frets, and, since the tension did not increase above that, another tool could be made to set the second octave without the compensation, the result being a fingerboard that will play to the twenty-fourth fret without the variation of even one sound wave from perfect tune in its whole length.

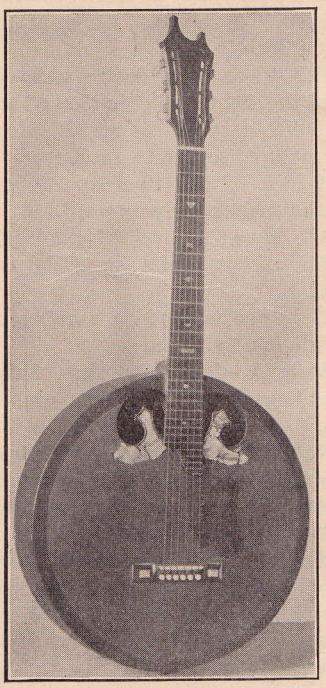
Do not be deceived by any fancy do-dads in the way of notches or backwards and forward settings of the bridge. Every string is in obedience to the same law; vis: The weight of the string plus the tension of the string will determine the pitch of the string. The do-dads only flatten the sharp-toned string so that the fault will not seem so bad, while the others are left to sound as they please. The best form of the bridge is the knife edge, as the very thin edge prevents any jar or side contact and so gives the purest tone that can be produced. The material is preferably ivory as it is the most elastic of anything there is and so conveys all the tone to the instrument.

In 1909 and 1910, during a trip through the East, we took occasion to visit violin makers and instrument makers in more than a score of cities, and found them all in the same boat, working along hap-hazard, trying to

divide the variations in tone so they would not be noticed. Add to this that guitars, zithers and banjos have been brought in to be corrected in this regard, from the finest to the cheapest grades of all makers, we, therefore, feel that our instruments are as nearly perfect as first-class material and human skill can make them, and so we send them out to all the world under an absolute guaranty of satisfaction as to durability, tone, ease of playing and material, or money refunded.

THE SUPER MANDOLIN

After several years' experience we finally began to classify the suggestions that came in from the players, who after all, are the court of last resort, they all agree in some particulars, so that we finally determined to put out an instrument in harmony with the suggestions which should be the very last word in the building of musical instruments. This is called the Super Mandolin, and differs from the others in having the back much more spherical so that the well known rolling motion of the old style mandolin may be employed. It is finished and built throughout to the one end to make it the very finest instrument in the world. The Super Mandolin is made regular in the eleven-inch size fitted with Coulter improved arm-rest tail piece, and has either Transparent Pyralin guard plate, or Lignum Vitae wood plate raised just a bit above the sound board.



The Coulter Round Guitar Style B. Especially Suitable for Steel Playing.

GENERAL DESCRIPTION

The Mandolins and Guitars are made of various woods selected for their beautiful grain, which are drawn over a frame or under fabric of birch, each skin being about one-sixteenth of an inch thick, these having the grain running in opposite directions, giving the well proven laminated construction that is unaffected by heat or cold or jars. This constitutes the sides and back, which are assembled under great tension and reinforced by concentric layers or lining of birch to stiffen the edges, the whole making an accident or fool proof frame or holding base for the sounding board, made of Spruce or California Redwood, which is first braced and bent up high in the center and then drawn down tight, giving the most responsive vibrating surface yet devised. The ornamental woods used are Rosewood, Mahogany, English Curly Poplar, Mexican Vermillion and Bird's Eye Maple, all carefully selected. The method of construction is such that the joints lay the one over the other at right angles, thus locking the whole in a complete unit. No celluloid or pyralin is used on the edges to break loose or come off. None is needed since end wood is everywhere exposed, thus greatly lessening liability to wear and accidents.

No oil varnishes are used, since a heavy coat of oil would surely destroy the resilience of the wood. Instead a clear beautiful spirit varnish is put on by rubbing, making the lightest possible perfect protection to an instrument. The polish will not chip or peel, and resists wear to the utmost.

MANDOLIN

The round Mandolin is made in three sizes. For those who want a very sharp tone, like the regular mandolin only much more of it, a 10-inch circle is used. Three inches deep.

The Coulter Harp Guitar

For those who desire a sweet and less sharp tone, suitable for orchestra or solo work, a mezzo-toned instrument, an 11-inch circle is used. Two and seven-eights inches deep.

For those who desire a great voice, the Schumann-Heinke of the mandolin family, powerful, deep and mellow, contralto in character, a 12-inch circle, two and three-fourths inches deep is used.

All have 14 inch focal scale length except when specially ordered.

They are made in a number of finishes, as follows:

Style A—Perfectly plain finish of mahogany or Koe with canvas case.

Style B—The top edge reinforced by the material of the back with a perfling, making a jointless finish on the whole instrument, a bit of pearl inlaid at the sound holes and guard plate, sides and back of mahogany, English poplar, or Koe. Canvas chip board case.

Style C—Same as B, with the addition of pearl inlay around the edge next the perfling and pearl trimmed at the sound hole, back and sides of English poplar, in case made of wood, covered with fabricoid imitation leather, black, opening like a violin case, corduroy lined.

A Piccolo Mandolin—Strung a fourth above the mandolin, with 10½ inch scale on a 10-inch circle body, 2½ inches deep. A most brilliant and piercing voice for orchestra leaders.

A Tenor Mandola—Strung on a 14-inch circular body, 3½ inches deep.

An Octave Mandola—Has an 18-inch scale with 14-inch body, 3½ inches deep. We especially recommend this instrument for small orchestras as most useful.

A 'Cello Mandola—Has a 24-inch scale with 16 or 18-inch body, 4 inches deep. The greatest voiced instrument of this character yet built anywhere.

A Double Mandola Bass—Has full 44-inch scale with 28-inch body, furnishing bass for orchestra of 25 or more pieces. Made only in the Style B finish.

Guitar style bridges, which greatly improve the character and power of the Bass tone, are furnished for $5.00 additional. Otherwise the Styles A., B. and C. are furnished with the nickled arm rest and tail piece used on regular mandolin in connection with an ivory bridge of the regular pattern.

The very best high grade plain machine heads, nickled, with white buttons, are used on all alike, for the reason that there are none better to be had, and they are none too good. Solid ebony finger boards fretted with German silver frets, plain edge, abalone position dots on all alike.

GUITARS

All styles of the round guitars are the same as for the mandolins, except that they all have guitar bridge, are built in either 16-inch or 18-inch bodies, 4 inches deep, having the grand concert scale 25-inch.

HARP GUITAR

Our Harp 12-String Guitar is put out as the latest word in this form of instrument, is 18 inches wide at the lower end and 42 inches long over all, and is built in the same manner as the mandolins, as per the cut, in Style C only.

The building of a satisfactory Harp Guitar involves one extreme difficulty. When the pressure of six to twelve contra bass strings is added to the pressure of the six fingerboard strings, the instrument has to be made so heavy and stiff that the tone and playing qualities of the fingerboard strings are destroyed in great part. If we leave the bracings and top light enough to give the playing qualities and add the basses to the bridge in the same line of pressure, the instrument will buckle, or else the basses will absorb the tone of the lighter strings. If on the other hand we make the top stiff and strong to prevent bending, the whole guitar is rendered stiff and clumsy. To obviate this obstacle we do not set the basses on the same bridge as the fingerboard strings, and we change the direction of pressure by drawing the basses from the bottom of the instrument over a bridge of the violin pattern set just behind the regular bridge, so that the finger board strings are as free as in a standard guitar.

A regular Grand Concert Guitar built upon the same mould as the big harp guitar without the extended arm, is built to order in Styles A. B. and C., as per cut.

MUTE MANDOLINS

For the use of those persons that find themselves in the hotels, or have to do their practicing in small rooms, so that they might annoy others in the immediate vicinity, we make a mute mandolin. Fashioned exactly on the lines of the regular mandolin, but made of a solid piece of Balsa Wood—the lightest in the world, weighs less than cork—it is made solid and gives a faint yet perfect tone in every register. The most delicate music may be played and every note will be perfect, yet not audible outside the room. Made to order only. Furnished without case unless otherwise ordered.

THE SPIRIT OF THINGS.

The fundamental mistake of the age is the intellectual concept that things can be done in a quantitative and mechanical way without destroying their value and usefulness, to say nothing of the entire loss of the art side of it. The great violins and other instruments of the past and the great paintings were the product of great loves and the individual efforts of passion driven men.

So it is with the creation of the instruments described in this circular. Indeed this idea has been at the heart of the whole endeavor, so much so that we run at the head of our office letters, this motto:

"Men do great things in order to express great loves. Without the loves the things are only caricatures of other men."

Mr. Frank E. Coulter, the creator and master builder of the instruments in this circular, is, by nature, both artist and scientist. He relinquished a career as a professional man, minister and platform orator with brilliant prospects, and turned to the creation of stringed musical instruments as the field of his creative endeavor.

The Master at His Bench

He soon found that an almost virgin field was open to him, because the endeavor has been, outside of the evolution of the piano, to build, not a great instrument, but to merely copy the form of an old one.

Following out this fundamental idea of personal service and personal touch, we have steadfastly refused the advice and kindly offered assistance of friends in the matter of a big factory—choosing to make our Mandolins, Guitars, Violins, or what nots real personal things, giving to each its own individuality, and rejoicing not in the number manufactured, but in the joy of having each one up to the same wonderful standard of skill and excellence.

It is not enough that instruments should be mechanical contrivances. No matter how excellent they may be, they must have character, express individuality and be at the head in their own class, else the work on them will have been in vain, and the time wasted, no matter what the return may be in money. This was the spirit of the Stradivarius and Guenarius, and is the spirit of the Coulter shops of today.