

Tucholsky Wagner Zola Scott
Turgenev Wallace Fonatne Sydon Freud Schlegel
Twain Walther von der Vogelweide Fouqué Friedrich II. von Preußen
Weber Freiligrath Frey
Fechner Fichte Weiße Rose von Fallersleben Kant Ernst Richthofen Frommel
Engels Fielding Hölderlin Eichendorff Tacitus Dumas
Fehrs Faber Flaubert Eliasberg Eliot Zweig Ebner Eschenbach
Feuerbach Maximilian I. von Habsburg Fock Ewald Vergil
Goethe Elisabeth von Österreich London
Mendelssohn Balzac Shakespeare Rathenau Dostojewski Ganghofer
Trackl Stevenson Lichtenberg Doyle Gjellerup
Mommsen Thoma Tolstoi Lenz Hambruch Droste-Hülshoff
Dach Thoma von Arnim Hägele Hanrieder Hauptmann Humboldt
Karrillon Reuter Verne Rousseau Hagen Hauff Baudelaire Gautier
Garschin Defoe Hebbel Hegel Kussmaul Herder
Damaschke Descartes Schopenhauer George
Wolfram von Eschenbach Darwin Dickens Grimm Jerome Rilke Bebel Proust
Bronner Campe Horváth Aristoteles Voltaire Federer Herodot
Bismarck Vigny Gengenbach Barlach Heine Grillparzer Georgy
Storm Casanova Lessing Tersteegen Gilm Gryphius
Chamberlain Langbein Lafontaine Iffland Sokrates
Brentano Strachwitz Claudius Schiller Bellamy Schilling Kralik Gibbon Tschchow
Katharina II. von Rußland Gerstäcker Raabe Gleim Vulpius
Löns Hesse Hoffmann Gogol Morgenstern Goedicke
Luther Heym Hofmannsthal Klee Hölty Kleist
Roth Heyse Klopstock Puschkin Homer Mörike Musil
Luxemburg La Roche Horaz Kraus
Machiavelli Kierkegaard Kraft Kraus
Navarra Aurel Musset Lamprecht Kind Kirchhoff Hugo Moltke
Nestroy Marie de France
Nietzsche Nansen Laotse Ipsen Liebknecht
Marx Lassalle Gorki Klett Leibniz Ringelntatz
von Ossietzky May vom Stein Lawrence Irving
Petalozzi Platon Pückler Michelangelo Knigge Kock Kafka
Sachs Poe Liebermann Kock Korolenko
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Piano Tuning A Simple and Accurate Method for Amateurs

J. Cree (Jerry Cree) Fischer

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PREFACE.

For some years past a lack of competent men in the profession of Piano Tuning has been generally acknowledged. This may be accounted for as follows: The immense popularity of the piano and the assiduous efforts of factories and salesmen have led to the result that nearly every well-to-do household is furnished with an instrument. To supply this demand the annual production and sale for the year 1906 is estimated at three hundred thousand pianos in the United States. These pianos must be tuned many times in the factory before they are shipped to the salesroom; there they must be kept in tune until sold. When, finally, they take up their permanent abode in the homes of the purchasers, they should be given the attention of the tuner at least twice a year. This means work for the tuner. But this is not all. Presuming that the average life of the piano is about fifty years, it is evident that there exists in this country an accumulation of instruments [Pg ii] variously estimated at from four to five millions. This means *more work for tuners*.

While production and accumulation have been increasing, there has been little, if any, effort made to provide tuners to look after the needs of this ever-increasing number of instruments, no provision for the thorough instruction of the learner of Piano Tuning, outside the walls of the factories, and of the few musical colleges where the art is taught. Doubtless there are many persons who are by nature well adapted to this agreeable and profitable occupation persons who would make earnest effort to acquire the necessary skill and its honest application if they had a favorable opportunity. Musical colleges in which tuning is taught are few and far between; piano factories are built for the purpose of producing pianos and not tuners, for mechanics and laborers and not for teachers and pupils; furthermore, very little fine tuning is done in the factory; rough tuning is the bulk of the work there, and a long apprenticeship in the factory, with its meager advantages, is rarely sufficient to meet the demands of the would-be-thorough tuner. This may account, in part, for the fact that [Pg iii] many who are incompetent are following this profession, and that there is an increasing demand for tuners of skill.

In view of these facts the author came to the opinion that if a course of instruction were prepared which would demonstrate clearly the many abstruse details of the art in an interesting and comprehensible way, it would be appreciated by those who are desirous to learn. Acting upon this impulse, he began the preparation of such a course.

The present book is the outgrowth of a course of instruction, used successfully with pupils from various parts of the United States and Canada, conducted partly by correspondence; partly at the school directed by the author. Although it has been necessary to revise the course somewhat for publication in the present form, no essential matter has been omitted and much has been added.

In preparing this course of study the utmost effort has been made to present the various topics in the clearest, most comprehensive manner, literary excellence being a secondary consideration.

While the book is designed for self-instruction, the systematic arrangement of the text, and the [Pg iv] review questions with each lesson, suggest its use as a text-book for schools and colleges which give personal training in the care of the piano.

To the talented individual of either sex who is ambitious to acquire a dignified and profitable profession, to the scientifically-inclined musician who is eager to learn the fundamental principles underlying all musical harmony, and finally to the non-professional who loves to read because of a fondness for science, the book is submitted; if it should prove a boon to the former, a benefit to the second, or a pleasure to the latter, I shall feel rewarded for the work of its preparation.

The Author.

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LESSON I.

INTRODUCTION.

Undoubtedly every human being is fitted for some sphere of usefulness some industry by which he can benefit mankind and support himself in comfort. Just what we are fitted for must, almost invariably, be decided by ourselves; and the sooner the better, else we may plod among the thousands whose lives are miserable failures for the reason that "they have missed their calling."

In the consideration of Piano Tuning as a profession, one should first determine if he possesses the necessary qualifications, the most important of which are a musical ear and some degree of mechanical ability. Having these, all else may be acquired by study. It is not necessary to possess a musical education or to be a musician; although a knowledge of music will be found a great aid. Still, an elementary [Pg 008]knowledge of the principles of music is a necessity to the student of this course, as it has been found impossible to avoid the use of a few technical terms. In most cases, however, they are set forth in such a way that they will be readily apprehended by anyone who has even a slight knowledge of the fundamental principles of music.

In teaching Piano Tuning, it is the custom of the "Central School of Piano Tuning," for which these lessons were originally prepared, to have all students prepare two lessons in harmony as a test of their acquaintance with the intervals and chords used in tuning. The lessons are not difficult, and they embody only those principles which are essential to the proper understanding of the key-board: the intervals of the diatonic scale and the major common chord in the twelve different keys, C, D, E, F, G, A, B, B-flat, D-flat, E-flat, G-flat, and A-flat. In connection with the harmony lessons, we use as a text-book "Clarke's Harmony," [A] and the student is required to master the first two chapters and prepare manuscripts upon each of the lessons. Below is a number [Pg 009]of the most important questions selected from those lessons upon which manuscripts have been written:

1. Every white key on the piano represents an "absolute pitch." By what names are these pitches known? How are the black keys named?

2. How many tones constitute the diatonic scale? Give numerical names.

3. Intervals are measured by steps and half-steps. How many steps from 1 to 3 in the diatonic scale? 1 to 4? 1 to 5? 3 to 5? 5 to 8? 1 to 8?

4. Why is there no black key between E and F, and between B and C?

5. From 1 to 3 is called an interval of a third; from 3 to 5, also a third; from 1 to 5, a fifth: they are so called because they include, respectively, three and five members of the diatonic scale. What is the interval 3 to 6? 2 to 5? 5 to 8? 2 to 6? 1 to 8?

6. Thirds are of two kinds: major (larger) thirds embrace two whole-steps; minor (smaller) thirds embrace a step and a half. What kind of a third is 1-3 in the diatonic scale? 2-4? 3-5? 6-8?

7. What do we mean by the term, Fundamental of a chord? What is added to it to complete the common chord?

8. What absolute pitches comprise the common chord of C? What kind of interval between the first two members? What between the first and last? What between the second and last?

9. What tones would you use if told to strike the common chord of C in four-part, close harmony, using the fundamental for the highest tone?

10. How many keys (white and black) are there between [Pg 010]the fundamental and the third? How many between the third and the fifth? How many between the fundamental and the fifth when the fifth is played above the fundamental?

11. How many keys (white and black) are there between two keys comprising a perfect fourth?

12. (Most important of all.) What keys of the piano keyboard comprise the common chord founded upon G as the fundamental?

Upon F? Upon F#? Upon G#? Upon B ♭ ? Upon D ♭ ? Upon E ♭ ?
Upon D? Upon E? Upon A? Upon B?

If one is able to answer these questions correctly he is qualified to begin the study of Piano Tuning.

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LESSON II.

GENERAL CONSTRUCTION OF THE PIANO; SOMETHING OF ITS EVOLUTION AND HISTORY.

The piano of today is, unquestionably, the most perfect, and consequently the most popular and beloved of all musical instruments.

That enchanting Queen of the home,
Whose place in the hearts of the family
Is as dear as though it could speak
In words of joy and sorrow,
Sadness or consolation;
Soothing, animating, enrapturing,
Charming away the soul
From its worldly weight of cares,
And wafting it softly
Into the realm of celestial dreams.

The untiring efforts of genius for over a century have succeeded in producing a musical instrument that falls little short of perfection. Yet other inventions and improvements are sure to come, for we are never content with "good enough."

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The student of these lessons may, in his practice, discover defective mechanical action and by his ingenuity be able to improve it; he may likewise see where an improvement can be made in acoustic construction; where a better scale can be drawn; or where different and perhaps new materials may be used for the component parts of the instrument. The possibilities are numerous along these lines, and in addition to bestowing a favor upon the general public, the man who has the originality to produce something new, places himself beyond want.

The inevitable inference is that the piano is an evolution of the harp principle. This instrument was known centuries previous to the Christian era. From the best history obtainable, we learn that

about three hundred years ago, the first effort was made to interpose a mechanical contrivance between the performer and the strings whereby it would only be necessary to strike the keys to produce tone from the strings, thereby decreasing the difficulty in finding the strings and picking them with the fingers, and greatly increasing the possibilities in musical rendition.

History gives credit to Italy for the first productions of this kind, about 1600 A.D., when the faculty [Pg 013]of music was beginning to manifest itself more boldly. Scientists saw that wonderful developments were possible, and we have reason to believe that experiments were made in England, France, Germany and all civilized countries about this time, for the production of the instrument which we call, in this day, a Pianoforte. (*Piano e forte*: soft and loud.)

At this time communication between the different countries was, of course, slow and uncertain, and experiments of this kind were probably unknown outside of the immediate neighborhood in which they were tried; therefore, much valuable and interesting history has not come to light. However, from the specimens which we have had the pleasure of seeing, and some of which we have had the opportunity to work on, we infer that about the same line of difficulties presented themselves to all of these early experimenters, most of which were not efficiently overcome until in the last century, and the most important of which it fell to the lot of American inventors to overcome.

Some of these early instruments were not even provided with dampers for stopping the tone when the key was released; consequently, when a number of [Pg 014]keys were struck in succession, the tone continued from all, so long as the strings would vibrate. The strings and sound-board being very light, the sustaining qualities were meager compared to those of the modern piano; consequently the dampers were not so much missed as they would be if removed from a modern upright or grand, which would surely render them unfit for use.

In the first attempts at piano building, the difficulties to be overcome may be enumerated as follows: The frames were not strong enough to resist the tension of the strings; they were made almost entirely of wood which yields to the pull of the strings and is subject

to climatic changes; the scale was very imperfect, that is, the length, tension and weight of the strings were not properly proportioned, the result being a different quality of tone from different portions of the keyboard; the actions were either heavy and imperfect, or too light to produce sufficient vibration; the proper point upon the strings for the hammers to strike and for the dampers to bear had not yet been ascertained; the preparation and seasoning of the wood for the different parts of the instrument had not received sufficient attention.

[Pg 015]

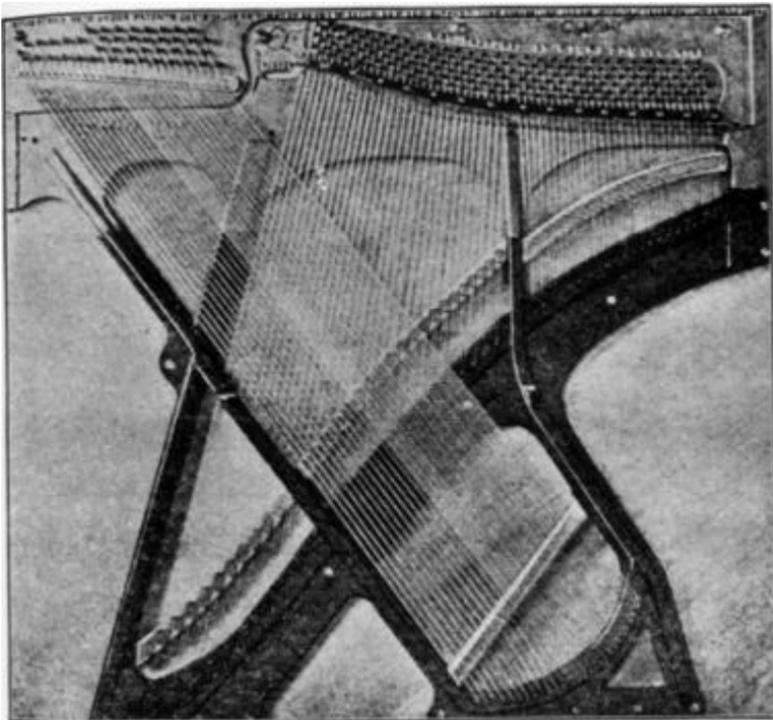
One cannot conceive how difficult it is to produce something that has never existed, until he tries. The requirements necessary to such results as are obtainable from the modern piano are numerous and rigid and the result of many costly experiments.

Probably the most important essential in piano building is the production of a frame of such strength and stability that the enormous tension of the strings is completely resisted in all parts of the scale. In many of the cheaper pianos of this day, the lack of this essential manifests itself in an annoying degree to the piano tuner. In tuning, the workman "brings up" his temperament in the middle of the instrument; in most cases the temperament stands all right. He next tunes the treble, then the bass; after doing his work perfectly he will often find that the treble fell somewhat while he was bringing up the bass; or, in a few cases, he may find that the treble sharpened, thus showing that there was yielding of the frame. Of course, this defect might be overcome by using an extremely heavy metal plate and wooden frame; but the commercial side of the question, in this day, calls for lightness in the instrument as a check to the expense of production, and, consequently, pianos that [Pg 016]are "made to sell" are often much too light to fulfil this requirement.

In the upright piano, the back frame of wood is first made; at the top of this is the pin-block, sometimes called the wrest-plank. This is composed of several layers of wood firmly glued together with the grain running in different directions to prevent splitting and warping. Into this plank the tuning pins are driven. The sound-board is fitted firmly into this frame of wood below the pin-block.

Next, the strong metal plate is secured to the frame by large bolts and screws. Openings are left in the plate for the bridges, which project from the sound-board beyond the metal plate; also for the tuning pins, action bracket bolts, etc.

At the lower end of the plate, and just below the bridges, [B] the hitchpins are driven firmly into holes drilled to receive them. Their purpose is to support the lower ends of the strings. The bass strings are separate, and each has a loop with which to fasten it to the hitchpin. In the treble, one piece of wire forms two strings; the two ends are secured to the [Pg 017]tuning pins above, and the string is simply brought around the hitchpin. The bridges communicating with the sound-board are at the lower end of the sound-board. Notice, there is a portion of the length of each string between the bridge and the hitchpin.



At the upper end of the strings, a "bearing-bar," situated between the tuning pins and upper bridge, is attached to the pin-block by screws which draw it inward; its function is to hold the strings firmly in position. You will notice that the lengths of the strings, above the bearing-bar, vary considerably, even in the three strings comprising the unison. (We will speak of the effect of this in tuning, farther on.)

After that portion of the case is completed which forms the key-bed or action frame, we are ready to set in the

Action

By this is meant the keys and all those intricate parts which convey the motion of the key to the hammers which strike the strings, and the dampers which mute them.

The requisites of the action are as follows:

The keys must descend quickly and easily at the touch of the performer, giving quick response.

[Pg 018]

The weight of the hammer must be properly proportioned to the strings it causes to vibrate.

The hammer must rebound after striking the string. (Where the hammer remains against the string, thereby preventing vibration, the term "blocking" is used to designate the fault.)

The action must be capable of quick repetition; that is, when a key is struck a number of times in quick succession, it must respond perfectly every time.

After striking and rebounding from the string, the hammer should not fall to its lowest position where it rests when not in use, as this would prevent quick repetition. For catching the hammer at a short distance from the string, a felted piece of wood suspended on a wire, called the back check, rises when the key is depressed, and returns when the key is released, allowing the hammer to regain its resting position.

A damper, for stopping the tone of the string when a key is released, must leave the string just before the hammer strikes, and return the instant the key is released.

A means must be provided for releasing all the dampers from the strings at the will of the performer. [Pg 019]The loud pedal, as it is called, but more properly, the damper pedal, accomplishes this end by raising the dampers from the strings.

In the square and the grand piano, the action is under the sound-board, while the strings are over it; so the hammers are made to strike through an opening in the sound-board. In the upright, the strings are between the action and the sound-board; so no opening is necessary in the latter.

The "trap-action" consists of the pedals and the parts which convey motion to the action proper.

QUESTIONS ON LESSON II.

1. What have been some of the salient obstacles necessary to overcome in producing the perfected piano?
2. Of what use are the dampers? Explain their mechanical action.
3. Mention several of the qualities necessary to a good action.
4. Describe the building of an upright piano.
5. Contrast the musical capacity and peculiar characteristics of the piano with those of the organ, which has the same keyboard.

[Pg 020]