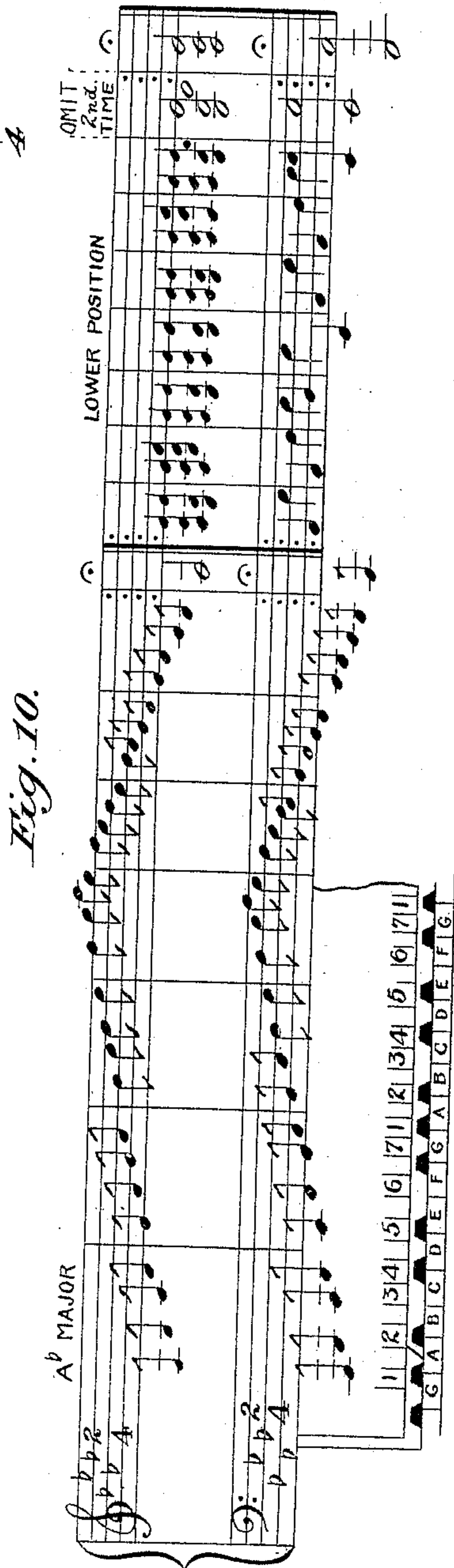
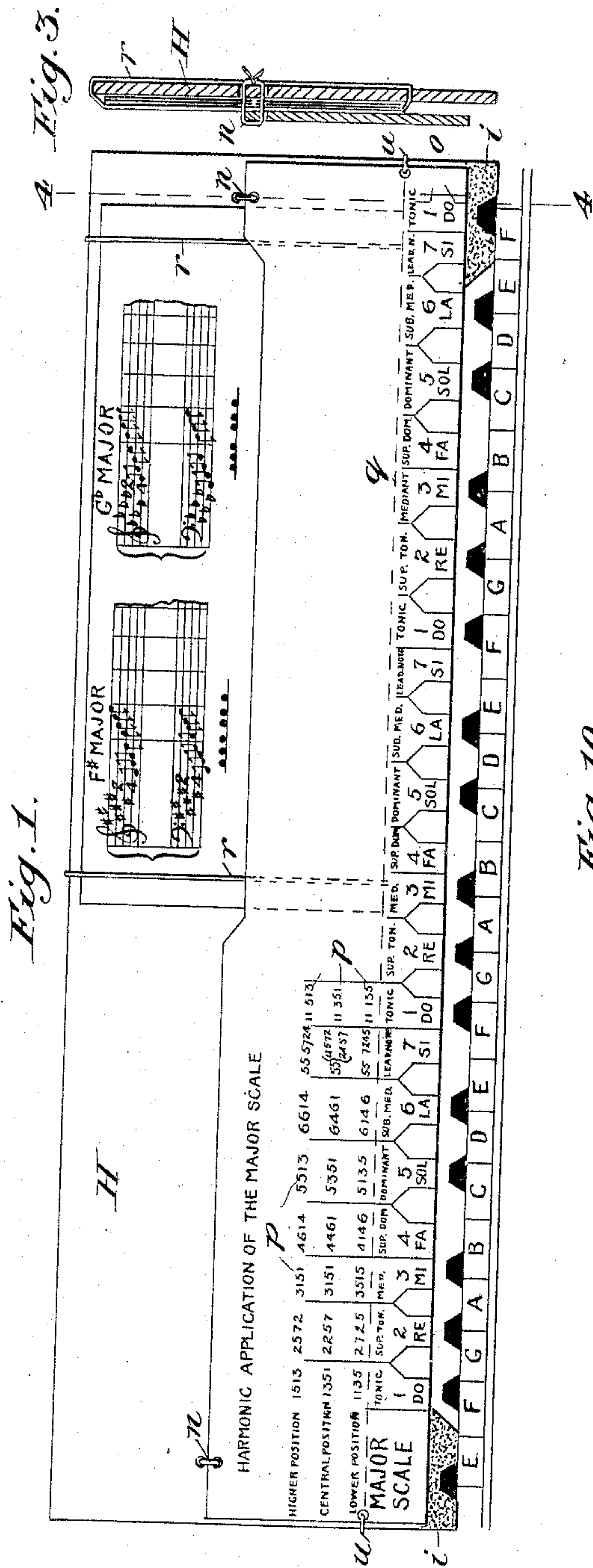


946,291.

Patented Jan. 11, 1910.
3 SHEETS—SHEET 1.



Witnesses:

Arch. D. Milken
F. L. Millson

Inventor:
Samuel B. Turner.

946,291.

3 SHEETS—SHEET 2.

Fig. 2.

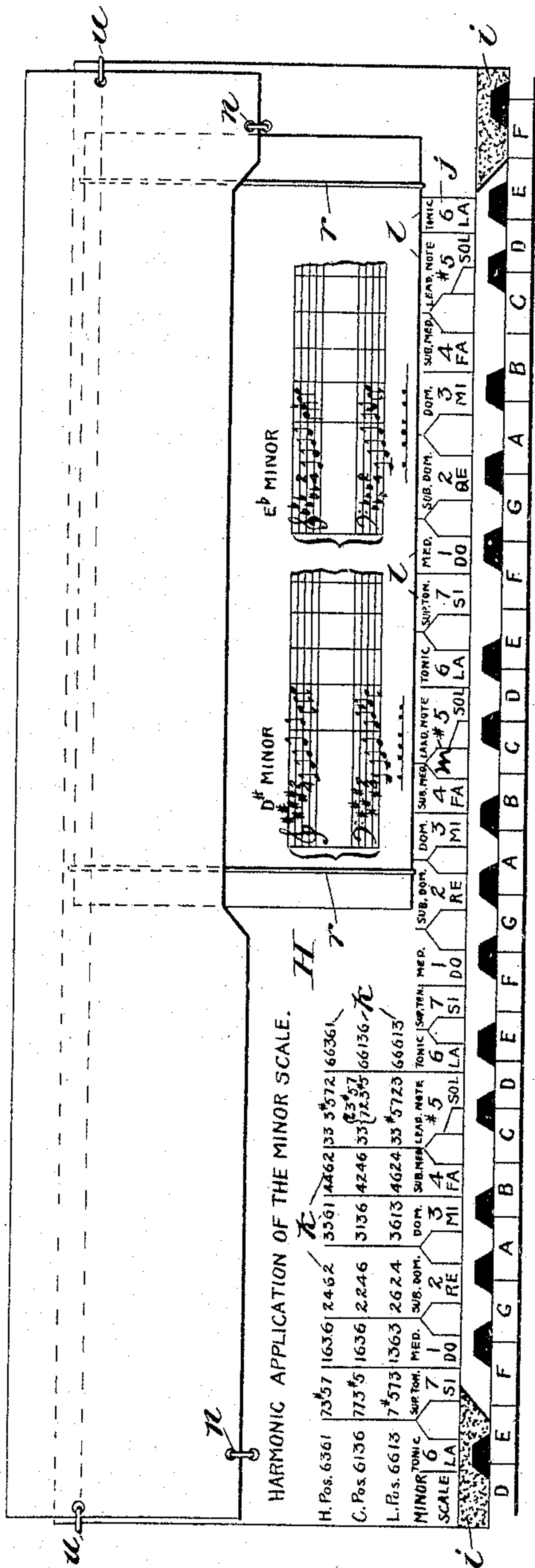
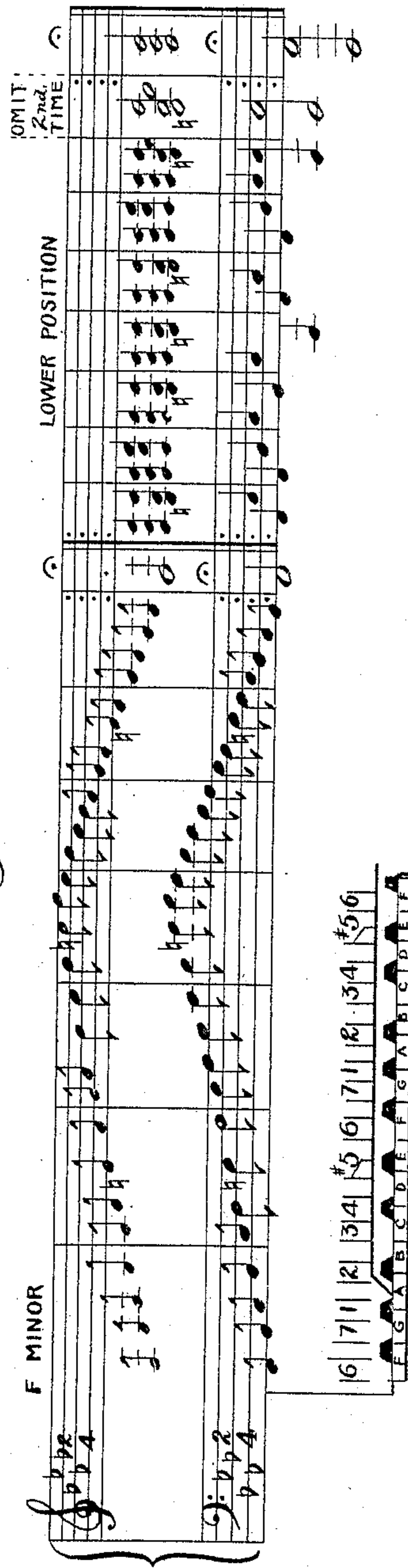


Fig. 11.



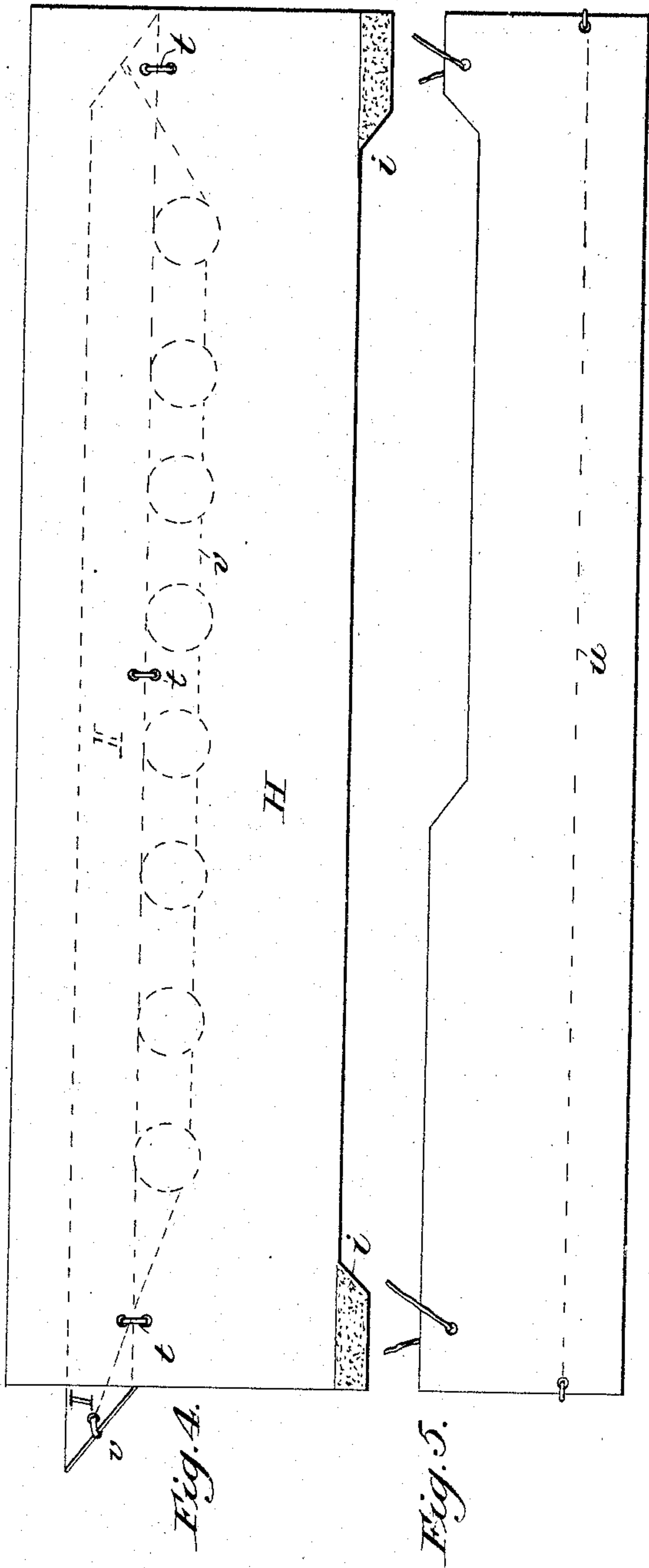
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946,291.

Patented Jan. 11, 1910.

3 SHEETS—SHEET 3.



Witnesses:
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Fig. 6.

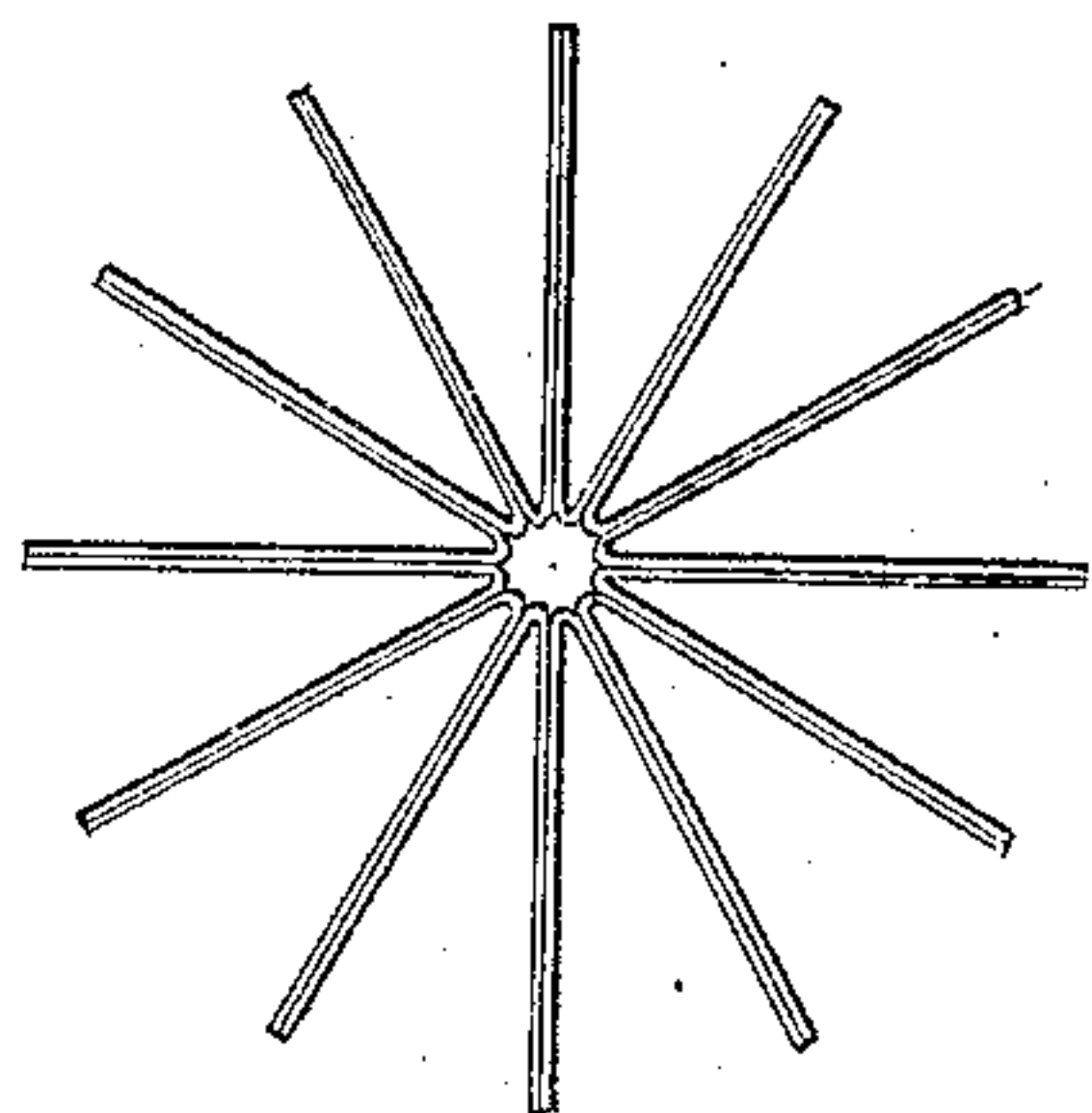


Fig. 7.

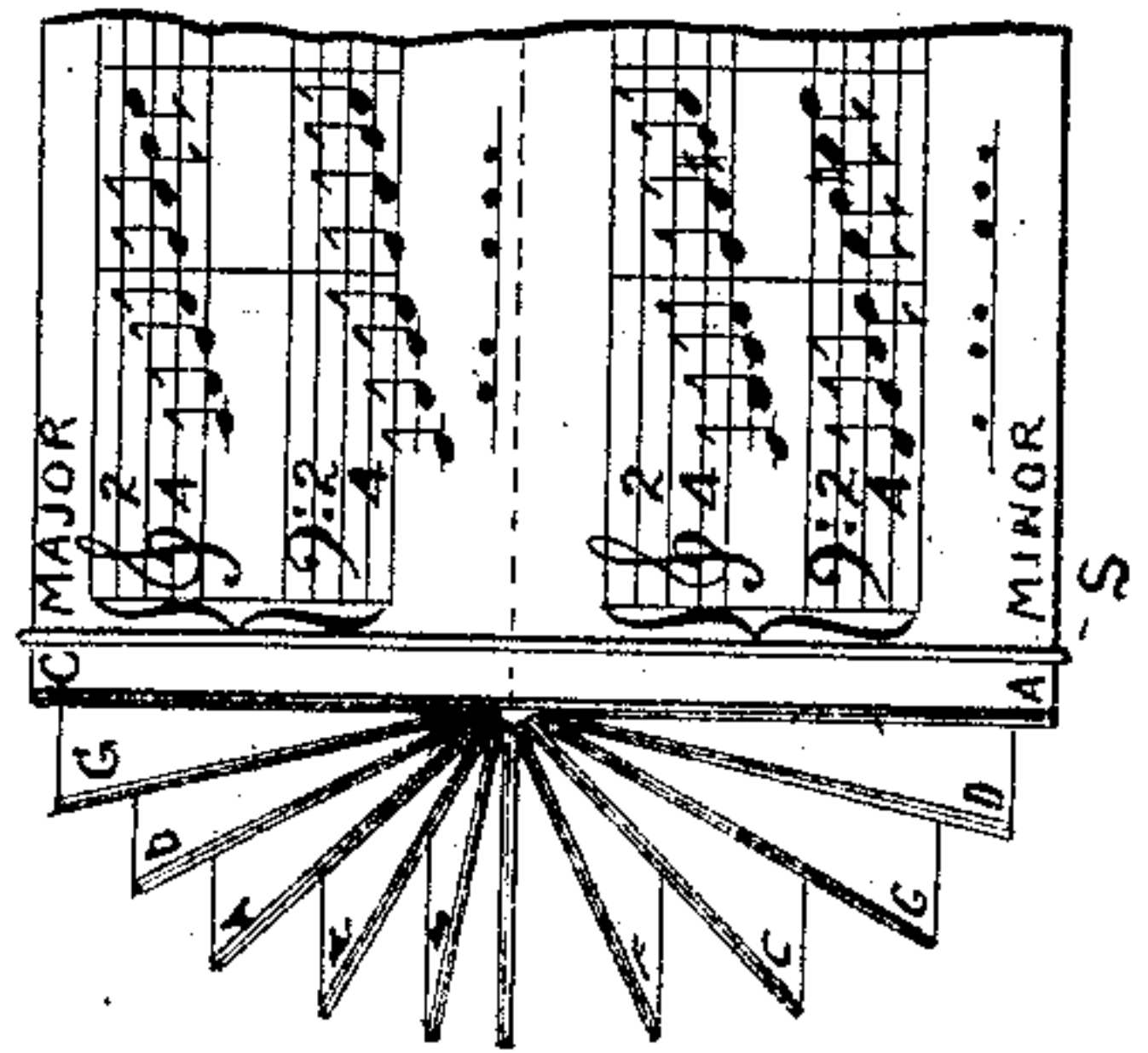


Fig. 8.

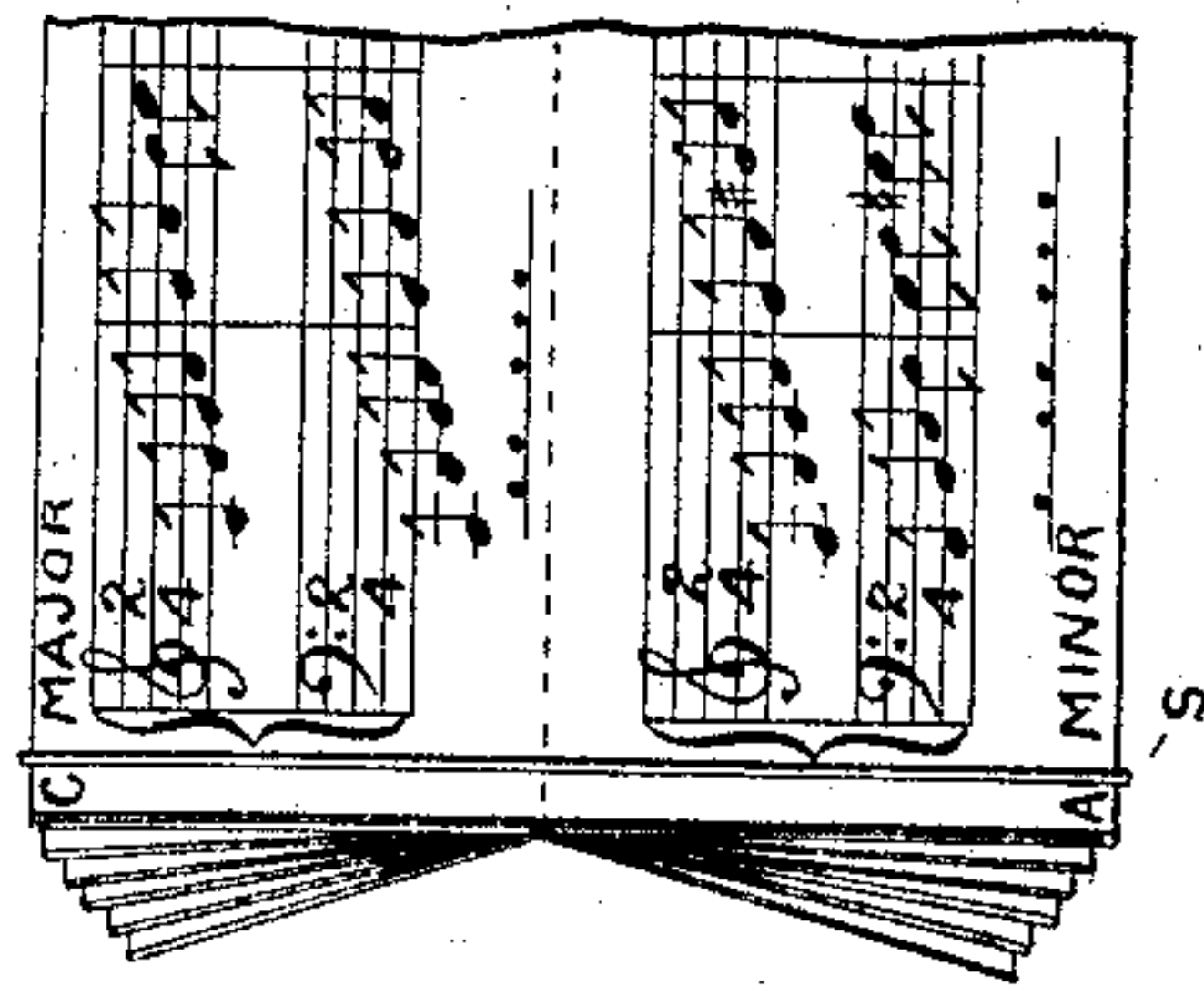
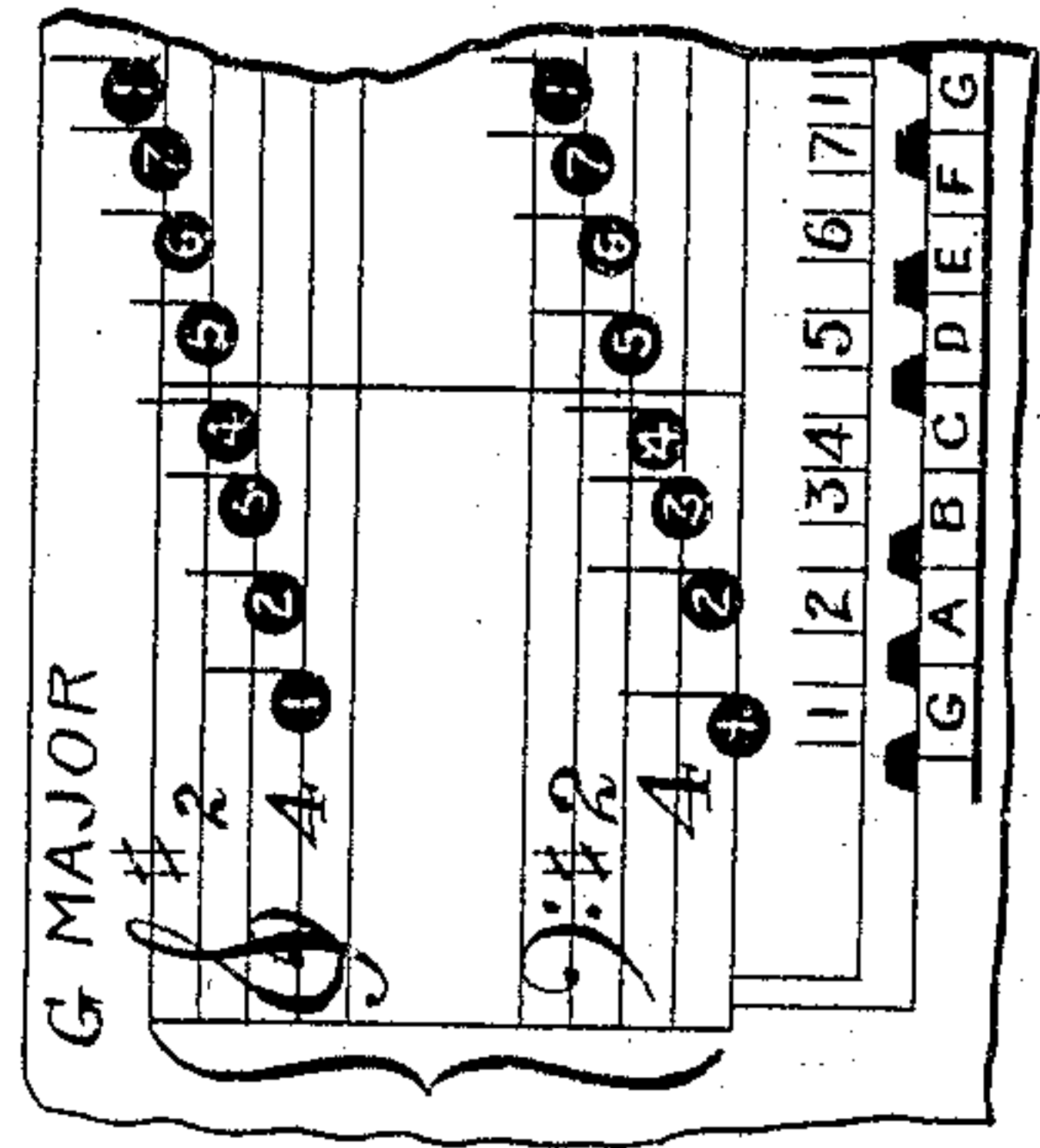


Fig. 9.



Inventor:
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UNITED STATES PATENT OFFICE.

SAMUEL B. TURNER, OF ST. LOUIS, MISSOURI.

MECHANICAL MUSIC-CHART.

946,291.

Specification of Letters Patent. Patented Jan. 11, 1910.

Application filed April 15, 1908. Serial No. 427,168.

To all whom it may concern:

Be it known that I, SAMUEL B. TURNER, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Mechanical Music-Charts, of which the following is a specification.

This invention relates to improvements in a mechanical music chart, and it consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth, and specifically claimed.

The principal objects of my invention are, first, to provide a mechanical music chart, for students and teachers of vocal or instrumental music, which shall be simple in construction and operation, being usually designed and arranged as illustrated in the accompanying drawings, and may be used either with or without a piano, organ or other musical instrument; second, to provide such a device as will illustrate the diatonic scale and aid the student in reading or playing written or printed musical compositions in all the different major and minor keys used in practical music; and, third, will show the relation between major and minor music with the principal chords of each as commonly employed when accompanying either vocal or instrumental music, and fully illustrate the circle of fifths as applied to transpositions and modulations.

Other objects and advantages of my invention, will appear in the description hereinafter contained.

In order to enable others, skilled in the art to which my invention pertains, to make use of the same, I will now proceed to describe it, referring to the accompanying drawings, in which:

Figures 1 and 2, are views in front elevation, showing the mechanical music chart, as used with a piano or organ, in which the device is so arranged as to illustrate the diatonic scale in the enharmonic keys of F# and Gb major, as shown in Fig. 1, and their relative keys D# and Eb minor, as shown in Fig. 2. Fig. 3, is a cross-sectional view, taken on line 4—4 of Fig. 1, showing the continuous booklet located between the supporting piece and the pivoted scale piece as shown in Figs. 1 and 2. Fig. 4, is

a detached view of the supporting piece, showing the horizontal support connected therewith, as used with an organ or other like musical instrument provided with stops. Fig. 5, is a detached view of the pivoted scale piece ready to be connected with the supporting piece, as shown in Figs. 1 and 2. Fig. 6, is a cross-sectional view, showing the construction of the continuous booklet. Figs. 7 and 8, further illustrate the construction and use of the booklet. Fig. 9, is an enlarged view of a part of one of the pages of the booklet, showing the numerals representing the degrees of the scale, as located on the staves, directly over the corresponding keys of the instrument. Figs. 10 and 11, represent opposite pages of the booklet, selected at random, showing respectively major and relative minor scales and chord exercises.

Similar characters, and letters of reference, refer to like parts throughout the different views of the drawings.

H, represents the supporting piece which may be made of card-board, or other suitable material. This supporting piece is usually rectangular in outlines, with the exception of the lower central edge thereof which may be partly removed, and the remaining lower supports, (i), covered with felt or other soft material to prevent rattling, as shown in Figs. 1 and 2. This supporting piece has located on its front surface characters or syllables, or both, (j), representing the diatonic minor scale, and groups of characters, (k), representing the harmonic application of the minor scale, and words, (l), representing the degrees of the scale, to wit: tonic, supertonic, mediant, subdominant, dominant, submediant and leading note, the leading note being sharpened, (m), to correspond with the harmonic minor scale. This supporting piece has connected therewith, a pivoted scale piece, shown in Fig. 5. This scale piece should be connected with the supporting piece in two or more places, (n), as hereinafter described. The supporting piece also has connected therewith, the continuous booklet, partly shown in Figs. 6, 7, 8 and 9, the booklet being first adjusted so as to show the relative major and minor keys desired, and then connected with the supporting piece as illustrated in Figs. 1 and 2.

The pivoted scale piece, shown in Fig. 5,

is connected with the supporting piece with spring like cord connection, (*n*), or otherwise. This scale piece has on its front surface, characters or syllables, or both, (*o*), representing the diatonic major scale, and groups of characters, (*p*), representing the harmonic application of the major scale, and words representing the degrees of the scale, to wit: tonic, supertonic, mediant, subdominant, dominant, submediant and leading note, (*q*), the whole being arranged in such manner, that when the scale piece is raised, or lowered, there will be made to appear, alternately, such major or minor scales or chords, together with such other matters pertaining to music, as may be desired; the lowering of the scale piece showing one or more major scales, and chords corresponding therewith; and the raising of the scale piece likewise showing scales and chords belonging to the relative minor.

The continuous booklet, partly shown in Figs. 6, 7, 8 and 9, is located between the pivoted scale piece and the supporting piece, being held in position with rubber bands, (*r*), or otherwise, in such manner that when the scale piece is raised, matters pertaining only to minor music will be visible; and when the scale piece is lowered, matters pertaining only to major music will be visible, except so far as the two keys thus shown are related to each other. This booklet usually consists of twenty four pages, and is conveniently made of one sheet of thin strong paper, of rectangular form and suitable size, having printing on one side thereof, the printing being arranged and spaced in such manner that when the paper is folded, as shown in Figs. 6, 7 and 8, the opposite pages of the booklet, by turning either forward or backward, will show successively, the entire series of nearest related major and minor keys, used in practical music, and such other musical matter pertaining thereto as may be desired. The enharmonic major keys of F# and Gb, are made to appear on one page of the booklet, as illustrated in Fig. 1; while the enharmonic minor keys of D# and Eb are made to appear on the page opposite, as illustrated in Fig. 2. The booklet, when detached from the supporting piece and used alone, is further provided with a rubber cord, or band, (*s*), to hold the radiating leaves thereof in any position that may be desired, as shown in Figs. 7 and 8. On one side of the paper of which the booklet is formed, and opposite the printing thereon, paste is liberally supplied, and the paper is folded as shown in Fig. 6, in such manner as will make each leaf of the booklet of double thickness thus adding strength, uniformity and neatness: the two thicknesses of paper are then firmly pasted together with the printed sides of each leaf visible; the whole forming a continuous booklet for the reason

that the operator may begin at any page thereof, and on turning the pages either forward or backward, may repeat the entire series, or circle of fifths, either ascending with sharps, or descending with flats, as often as may be desired. This booklet being complete within itself, may be detached from the supporting piece and used separately, although it is better adapted in illustrating scales, chords or musical compositions when used in combination with the supporting piece.

Fig. 9, is an enlarged view of a part of one of the leaves of the continuous booklet, in the key of G major, showing a part of the scale as represented by notes having the degree numerals located thereon; the individual notes of the scale in ascending, are located directly over the corresponding keys of the instrument, as represented by the key-board below.

Figs. 10 and 11, show opposite pages of the continuous booklet, selected at random, showing scales, chords and musical compositions, in the keys of Ab major and F minor, on which pages all notes located on the staves, should show the degree numerals as illustrated in Fig. 9, thus showing what keys of the piano or organ should be used in the production of scales or chords as represented by the notes located on the staves, in combination with the horizontal row of larger numerals on the pivoted scale piece, if major music; and on the supporting piece, if minor music; the scale piece being raised, or lowered, to correspond with the requirements of the major or minor key that may be desired.

As there are various ways of arranging the scales, chords or other matters pertaining to music, on the different parts of the device, I will describe only such construction as will harmonize with the accompanying drawings. This arrangement consists of the supporting piece having the booklet connected therewith, with elastic rubber bands, or otherwise, as shown in Figs. 1 and 2. The pivoted scale piece is then connected with the supporting piece, with spring like cord connection, (*n*), the booklet being located between the scale piece and the supporting piece, as shown in Figs. 1, 2 and 3. This spring like cord connection usually consists of two or more pieces of elastic cord, each cord being passed through one of the openings in the supporting piece thence through one of the openings in the scale piece, and back through the second opening in the supporting piece, as shown in Fig. 3; and when the horizontal support, (*I*), partly shown and fully outlined in Fig. 4 is used in connection with the stops of an organ, it should be likewise connected with the supporting piece, in two or more places, by passing each cord through one of the

openings in the horizontal support, as shown, (*t*), in Fig. 4. The cord is then tied sufficiently tight, to hold the scale piece in position when raised, as shown in Fig. 2; or when lowered, as shown in Fig. 1; and if desired, an additional rubber cord may be used, as shown, (*u*), in Figs. 1 and 2.

The foregoing arrangement, as a whole, is recommended for the reason that it simplifies and makes easily explainable, the circle of fifths, and such transitions and modulations as are likely to appear in musical compositions; and for the further reason that it is so easy to shift from any major key to its relative minor; or from any minor key to its relative major; simply by raising or lowering the pivoted scale piece, as may be required.

While I have shown illustrations of a mechanical music chart of three octaves, as applied to a piano-like instrument; yet, I do not desire to limit myself to such arrangement, as I may construct and arrange the device with a larger, or smaller, number of octaves; or change the arrangement of scales or chords; or I may add to, omit or change, letters, syllables, words, characters, chords or musical compositions; or reverse the arrangement of the major and minor scales and chords; or construct the device so as to show all major, or all minor; or dispense with the pivoted scale piece, thus enlarging the views of scales, chords, or musical compositions; or place scales, chords, or matters pertaining to major or minor music, on opposite sides of the pivoted scale piece; or combine certain elements of this device with certain elements of my former patents, without departing from the spirit of my invention.

When using my mechanical music chart, with the organ, I place it in an upright position, over the key-board, with the horizontal support resting on the stops thereof, and with the elastic cord, (*v*), under the stops of the organ, as illustrated in Fig. 4; thus firmly holding in position, by frictional contact with the stops, and locating the device immediately above the key-board. When it is desired to play or accompany a piece of music written in the key of C major, the device is adjusted by lowering the pivoted scale piece, and sliding the device to the right or left until the tonic, or key note, shown by the larger numeral 1, located to the extreme left, is directly over the C, next to the left of middle C, of the key-board of the instrument; then adjust the booklet so as to show the scale of C major, and place the booklet in position, as illustrated in Fig. 1. The device will then show only the scale of C major, and the chords, or exercises corresponding therewith. Should it then be desired to change to the key of A minor, simply raise the pivoted

scale piece, and the required change will follow; the scale piece being held in this new position, by means of the elastic spring like hinge, (*n*), aided if necessary by the additional rubber cord, (*u*), as shown in Fig. 2. When using the device with the piano, the horizontal support, shown in Fig. 4, is removed; the device is then placed in position over the key-board, with the two felt like supports, (*i*), immediately to the rear of the black keys, and resting on the white keys, as shown in Figs. 1 and 2, or the felt like supports may rest on the black keys. The device may be used without the booklet, in playing scales, by using in succession such keys of the instrument as are located under the horizontal row of larger numerals; and in the production of chords, by using simultaneously such keys of the instrument as are located under the horizontal row of larger numerals, and correspond with the groups of numerals illustrating the harmonic application of the scale.

From the foregoing it is evident that the twenty six major and minor scales, with chords or musical compositions corresponding therewith, can be illustrated either with or without the piano or organ, and can be more fully illustrated with the aid of such instrument, by placing the device in position over the key-board, and moving it to the right or left until the characters or syllables thereon correspond with the key-board, in the key desired; and at the same time adjusting the pivoted scale piece, and arranging the booklet, to correspond therewith.

When illustrating the circle of fifths, I remove the booklet from the supporting piece, and begin at any page thereof, preferably at the pages showing the signatures of C major and A minor, which signatures have neither sharps nor flats. Turning one leaf forward, we find one sharp in the signature, showing the keys of G major and E minor. Continuing; two sharps appear in the signature, showing the keys of D major and B minor; three sharps, A major and F# minor; four sharps, E major and C# minor; five sharps, B major and G# minor; six sharps, F# major and D# minor, being enharmonically the same keys as Gb major and Eb minor; five flats, Db major and Bb minor; four flats, Ab major and F minor; three flats, Eb major and C minor; two flats, Bb major and G minor; one flat, F major and D minor; the next page completing the circle of fifths, and showing the relative keys of C major and A minor, as in the beginning. Reversing the process by turning the leaves of the booklet backward, the flats in the different signatures will increase, and the sharps will diminish; the twelfth progressive transposition by fifths, either ascending with sharps, or descending with flats, will always correspond with the be-

ginning, regardless of where the start is made.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a mechanical music chart, the combination with a piano like instrument and a movable scale piece having numerals located thereon to register with the keys of the instrument in the different transpositions, of a booklet, showing a music staff, the staff having thereon ordinary round like notes the notes having numerals located thereon, substantially as described.

2. In a mechanical music chart, the combination with a supporting piece having thereon characters or syllables representing the diatonic scale, of a series of scale charts forming a continuous booklet detachably connected therewith, the booklet having doubled leaves in radial form and showing respectively on opposite pages thereof, in the different transpositions, relative major and minor scales, substantially as described.

3. In a mechanical music chart, the combination with a supporting piece having connected therewith a continuous booklet, the various pages of the booklet being arranged so as to show, alternately, relative major and minor scales and chords in the different transpositions, of a pivoted scale piece connected with the supporting piece with hinge like connection, and when the scale piece is raised or lowered, alternately exhibiting opposite pages of the booklet, substantially as described.

4. In a mechanical music chart, the combination with the key-board of a piano or organ, of a supporting piece having thereon characters or syllables representing the diatonic scale and chords, the supporting piece

having a continuous booklet connected therewith, the various pages of the booklet being arranged so as to show on opposite pages thereof such relative major and minor scales and chords as are related to each other in the different transpositions, the supporting piece having a pivoted scale piece connected therewith, the scale piece having thereon characters and syllables representing the relative diatonic scale and chords as compared with those located on the supporting piece, the scale piece, when operated, alternately exhibiting opposite pages of the booklet, substantially as described.

5. In a mechanical music chart, the combination with the key-board of a piano or organ, of a supporting piece having thereon characters or syllables representing the diatonic scale and chords, the supporting piece having a continuous booklet detachably connected therewith the various pages of the booklet being arranged so as to show on opposite pages thereof such relative major and minor scales and chords as are related to each other in the different transpositions, the supporting piece having a pivoted scale piece detachably connected therewith, the scale piece having thereon characters and syllables representing the relative diatonic scale and chords as compared with those located on the supporting piece, the scale piece, when operated, alternately exhibiting opposite pages of the booklet, substantially as described.

Signed at St. Louis, Missouri, this 10th day of April 1908.

SAMUEL B. TURNER.

Witnesses:

ARCH D. MILLSON,
F. L. MILLSON.