F. SITTON.

ENHARMONIC PIANO.

APPLICATION FILED MAY 18, 1907.

963,256.

Patented July 5, 1910.

4 SHEETS—SHEET 1.

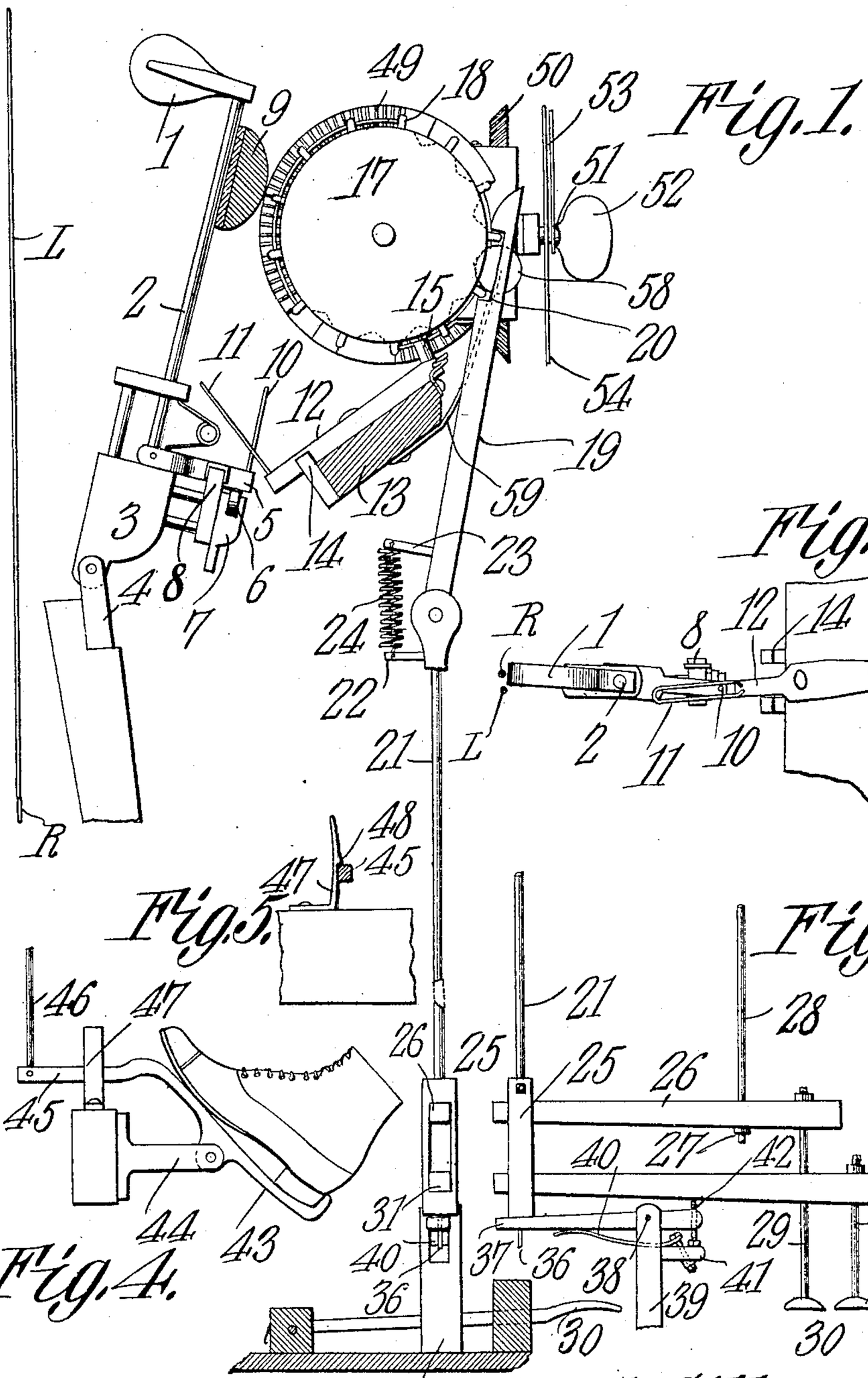

Fig. 1.

Fig. 2.

Fig. 5.

Fig. 4.

Fig. 3.

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4 SHEETS—SHEET 2.

Fig. 15.

No.	Key	C		D		E	F		G		A		B	C
1	F#	256	273.3+	288	303.4+	324	341.3+	364.5	384	410.+	432	455.1+	486	512
2	B	256	273.3+	288	303.4+	324	341.3+	364.5	384	404.8+	432	455.1+	486	512
3	E	256	269.6+	288	303.4+	324	341.3+	364.5	384	404.8+	432	455.1+	486	512
4	A	256	269.6+	288	303.4+	324	341.3+	360	384	404.8+	432	455.1+	486	512
5	D	256	269.6+	288	303.4+	324	341.3+	360	384	404.8+	432	455.1+	486	512
6	G	256	269.6+	288	303.4+	320	341.3+	360	384	404.8+	432	455.1+	480	512
7	C	256	269.6+	288	303.4+	320	341.3+	360	384	404.8+	432	455.1+	480	512
8	F	256	269.6+	284.4+	303.4+	320	341.3+	360	384	404.8+	426.6+	455.1+	480	512
9	B♭	256	269.6+	284.4+	303.4+	320	341.3+	360	384	404.8+	426.6+	455.1+	480	512
10	E♭	252.8+	269.6+	284.4+	303.4+	320	341.3+	360	379.2+	404.8+	426.6+	455.1+	480	512
11	A♭	252.8+	269.6+	284.4+	303.4+	320	337.1+	360	379.2+	404.8+	426.6+	455.1+	480	505.6+
12	D♭	252.8+	269.6+	284.4+	303.4	320	337.1+	360	379.2+	404.8+	426.6+	455.1+	480	505.6+
13	G♭	252.8+	269.6+	284.4+	299.7+	320	337.1+	360	379.2+	404.8+	426.6+	449.3	480	505.6

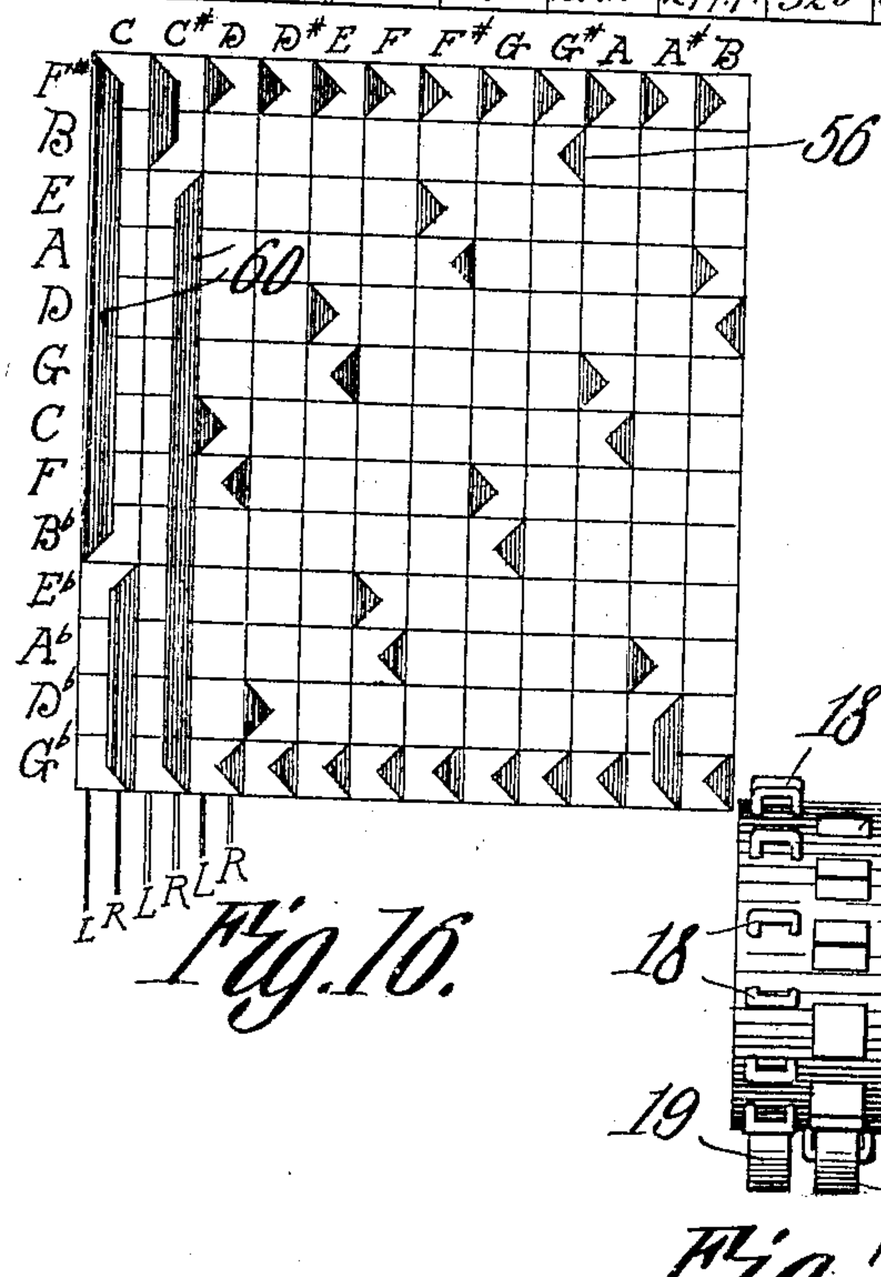

Fig. 16.

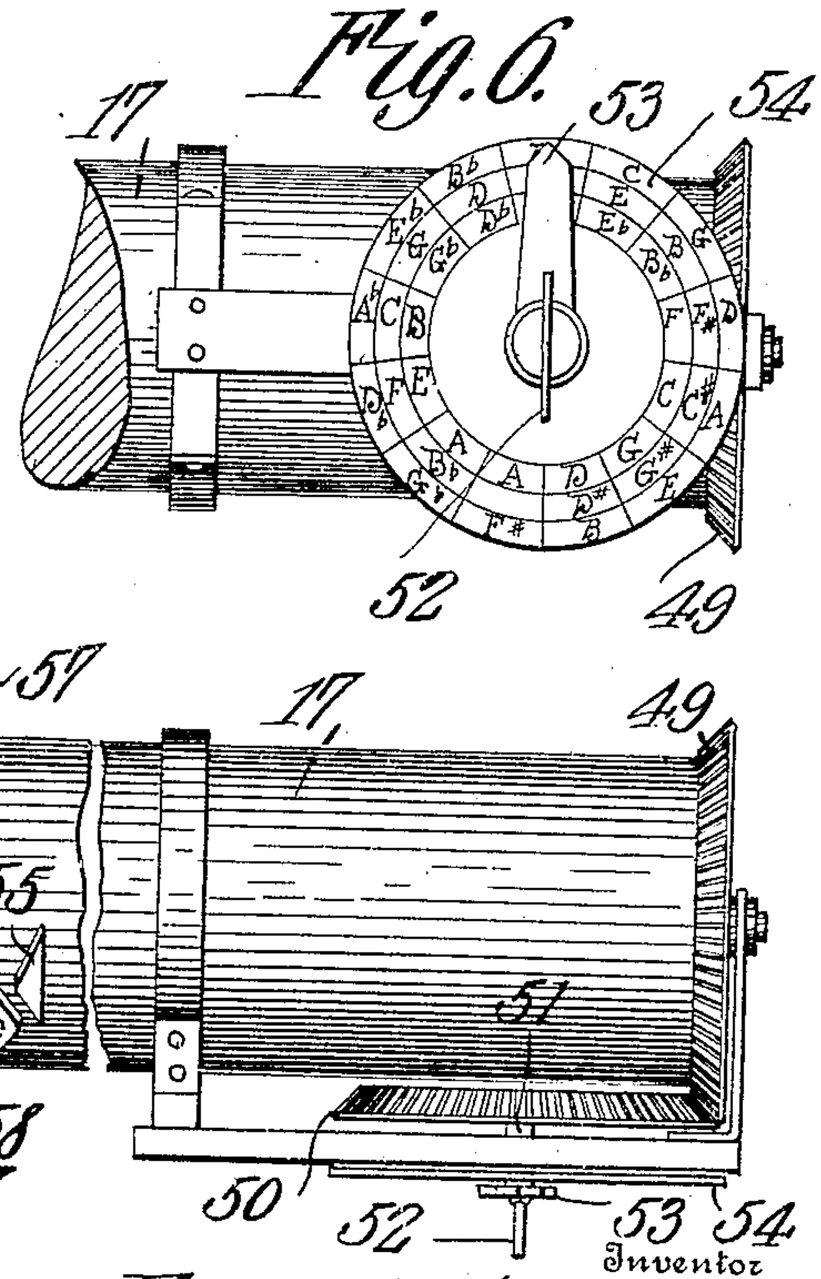

Fig. 7.

Fig. 6.

Witnesses

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4 SHEETS—SHEET 3.

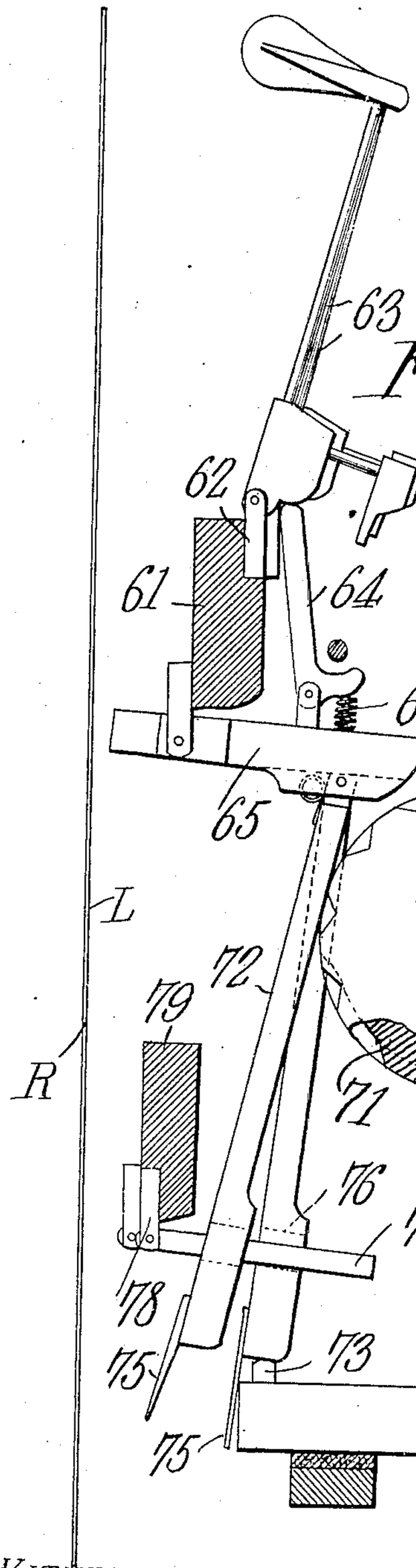

Fig. 8.

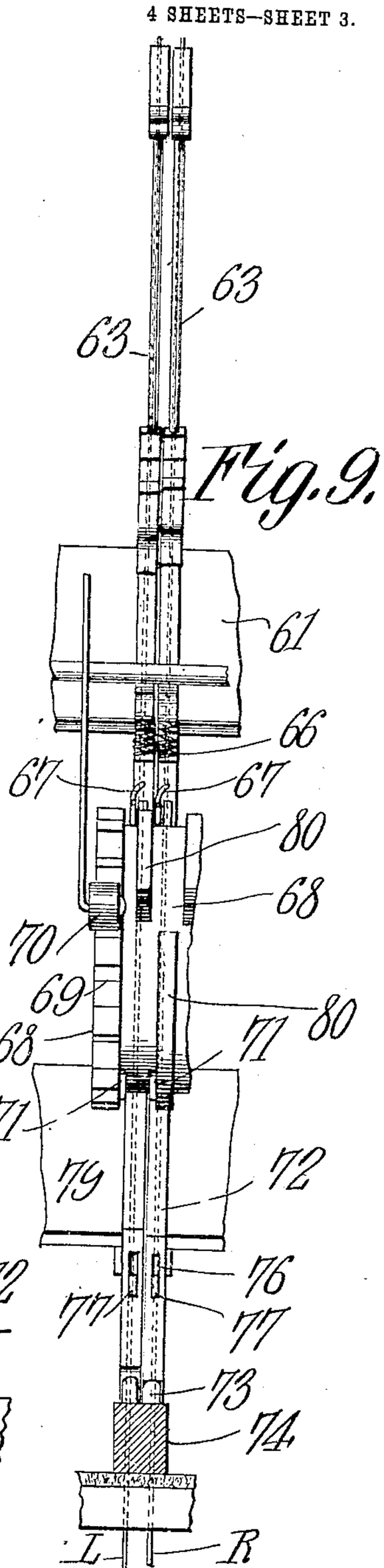

Fig. 9.

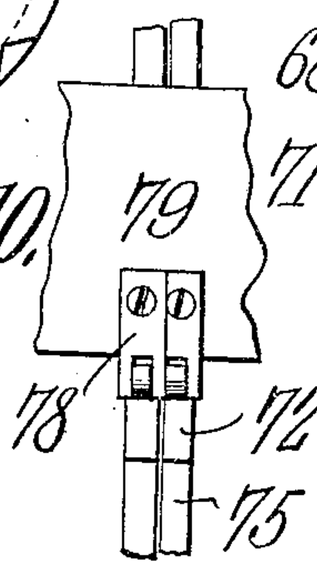

Fig. 10.

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4 SHEETS—SHEET 4.

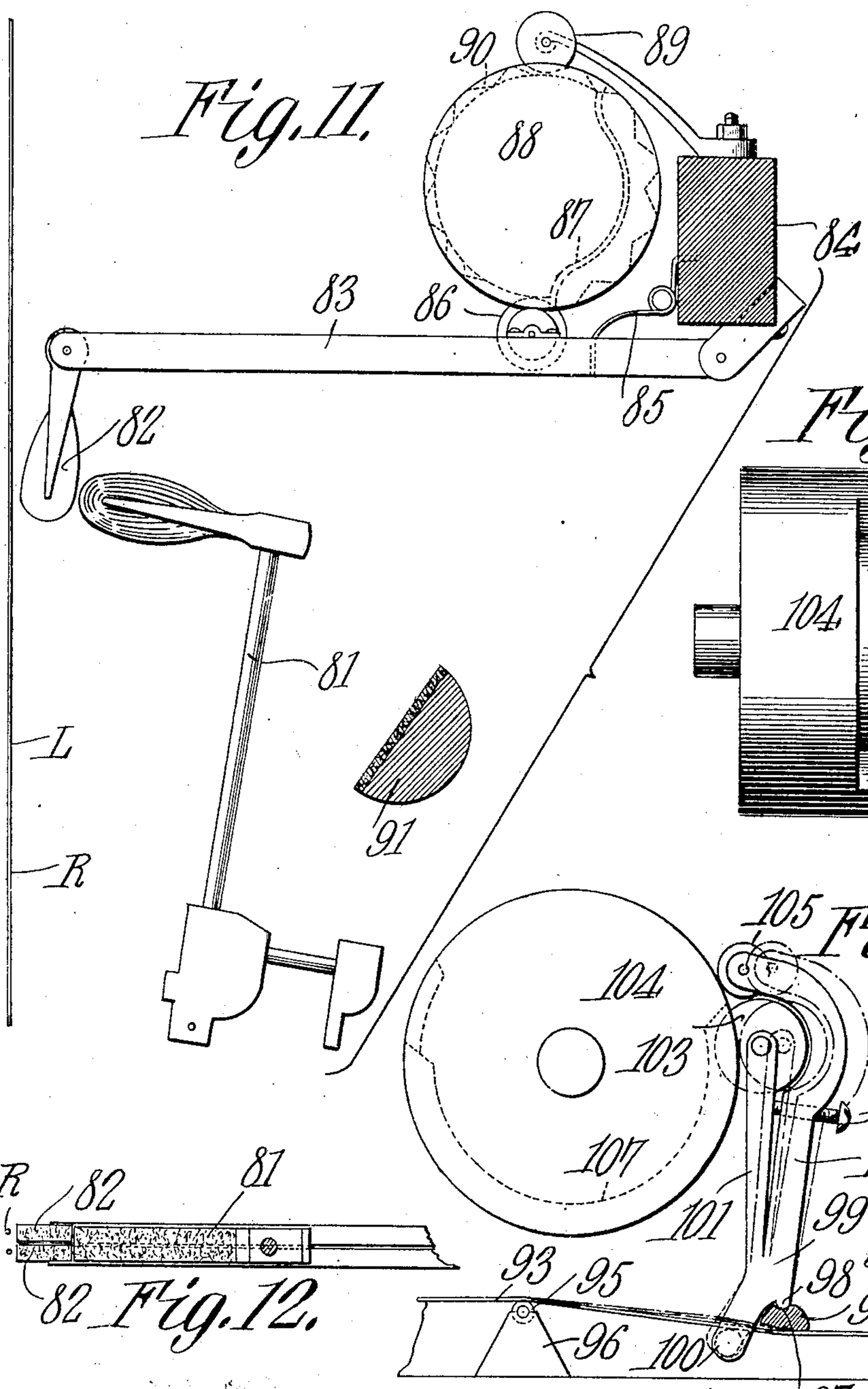

Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.

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ENHARMONIC PIANO.

963,256. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed May 18, 1907. Serial No. 374,326.

To all whom it may concern:

Be it known that I, FRANK SITTON, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented a new and useful Enharmonic Piano, of which the following is a specification.

This invention relates to enharmonic pianos and more particularly to means whereby practically the correct diatonic scale can be used in all keys thereby rendering it unnecessary to temper an instrument to the extent heretofore necessary in order to eliminate the comma which produces the harshness commonly known as the "wolf."

It is a well known fact that in music each octave contains seven distinct steps of pitch constituting the gamut and that the vibrations of the notes of the just diatonic scale bear a well known predetermined ratio to one another. Between certain of the notes constituting the just diatonic scale are interposed semi-tones whereby any tone can be selected as the beginning of a gamut. The natural ratios between the tones are such that if any note other than the "C" or "do" of the just diatonic scale is used as the key-note the ratios between the successive notes would ordinarily be incorrect. This difficulty has heretofore been overcome by tempering the tones of the just diatonic scale by increasing or diminishing the number of vibrations to slightly sharp or flat the just tones and thereby permit any note to be used as the key note. It is of course obvious, however, that where this tempering is carried out none of the gamuts is just, and perfect intervals can not therefore be produced. It has been found that by providing two tones for each note of a gamut, said tones being separated by the interval of a didymus comma (having the ratio 81/80), it is possible by producing one tone or the other of each note, according to the gamut to be played, to play a just diatonic scale in nearly every key.

It is the object of the present invention to provide means particularly designed for use in connection with a piano or other similar stringed instrument, whereby either of two tones may be produced for each note, the proper tones being selected automatically to suit the key in which the gamut is to be played. By means of this mechanism the necessity of tempering the instrument is entirely eliminated and the major and minor scales and even the old Pythagorean scale can be correctly used in all keys.

With this and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings are shown the preferred forms of the mechanism utilized for selecting the tones constituting the natural gamut in any key.

In said drawings: Figure 1 is a view partly in section and partly in side elevation of mechanism for shifting a sounding element so that either of two strings of a note can be sounded, according to the key in which the gamut is to be played; Fig. 2 is a plan view of the hammer shown in Fig. 1 and of the actuating lever provided therefor, the selective cylinder being removed; Fig. 3 is a front elevation of the pedal mechanism shown in Fig. 1; Fig. 4 is a side elevation of a modified form of pedal for actuating the shifting mechanism; Fig. 5 is a detail view showing the means for locking the pedal shown in Fig. 4 in adjusted position; Fig. 6 is a front elevation of one end of the selective cylinder and showing the indicator used in connection therewith and the hand-operated means for actuating the cylinder; Fig. 7 is a plan view of the parts shown in Fig. 6; Fig. 8 is a side elevation of a modified form of mechanism for selecting either of two strings; Fig. 9 is a front elevation of the mechanism shown in Fig. 8; Fig. 10 is a detail view showing the staggered relation of the holding brackets of the mechanism shown in Figs. 8 and 9; Fig. 11 is a side elevation showing another modified form of string selecting mechanism; Fig. 12 is a bottom plan view of the hammers shown in Fig. 11; Fig. 13 is a side elevation of another form of the apparatus, the same being designed to tune the strings to produce just intervals between the tones in any key; Fig. 14 is a plan view of a portion of the selective cylinder shown in Fig. 13; Fig. 15 is a chart showing the number of vibrations necessary for each tone in each key in which the tone is used in order to produce practically a just diatonic scale; and Fig. 16 is a diagrammatical view showing the relation of a portion of the selective cylinder to the strings of the notes of an octave and indicating the strings of each note to be

sounded in each key in order to produce just intervals.

As heretofore stated it is the intention to provide each note with two sounding bodies one of which is designed to produce a few more vibrations than the other so that in playing the note in any key the proper tone can be produced by vibrating the proper sounding body. In Fig. 15 I have shown a chart on which are indicated the number of vibrations necessary for every note of the middle octave in the different keys in which said note is used. By assigning 256 vibrations to middle C the number of vibrations of the succeeding tones in the key of C can be obtained by calculating along the well established ratios of the just diatonic scale. These vibrations are indicated on the seventh line of the chart. By calculating upward a perfect fifth from C of 256 vibrations the vibrations of the tonic of the key of G are obtained and from this tonic the proper vibrations of the remaining notes of the just diatonic scale in the key of G can be obtained by following the well known ratios. These vibrations have been indicated on the sixth line of the chart. By further calculating upward in perfect fifths in this manner the number of vibrations of the tonics of the keys of D, A, E, B and F♯ can be obtained. All of these tonics have been underscored on the chart. By calculating downward by perfect fifths from C the tonics in the keys F, B♭, E♭, A♭, D♭, and G♭, are obtained, said tonics being underscored on the chart. The number of vibrations of each tone of the just diatonic scale in each key can be obtained by calculating upwardly from the tonic of each key by means of the well known ratios. The proper succession of the notes in each key has been indicated on the chart by numerals located in small squares. By calculating successively in fifths in the manner above set forth, the correct results will show that in some of the columns three or four different values are obtained. For example, in column A♯ No. 2 should be 455.0, and No. 1 should be 455.6; Nos. 8, 9, and 10 should be 455.1; No. 11 should be 455.8, and No. 12 should be 449.5. It will thus be seen that several different values are produced and it is necessary to temper some of them so that the ratio 81/80 will occur between the higher and the lower values. This is true in some of the other columns, whereas in still other columns the exact ratio of 81/80 is obtained by successively calculating in fifths. By analyzing the results obtained by the calculations above mentioned and which are shown in Fig. 15, it will be noted that each note requires the use of two different numbers of vibrations according to the key in which it is to be used. It will be further seen that these two sets of vibrations have the ratio of 81/80, otherwise known as the didymus comma. In constructing a musical instrument it is designed to provide each note with two sounding bodies tuned in the proportions set forth upon the chart referred to.

Different forms of apparatus have been devised by me for producing either of two tones for each note and for automatically selecting the proper tones according to the key. In Figs. 1 to 3 has been shown one form of mechanism provided for this purpose. By referring to these figures and which merely show mechanism for sounding either of the strings of one note have been shown two strings designated "L" and "R" respectively, the string "L" being tuned to produce 253 vibrations per second and the string "R" 256 vibrations. A hammer 1 is provided for both of the strings "L" and "R" and is rigidly connected to a stem 2 mounted to rock within a supporting butt 3 pivoted in a bracket 4. An arm 5 is secured to and extends radially from the stem 2 and its outer or free end bears upon an anti-friction roller 6 supported in a bracket 7 extending from the block 3. Stop projections 8 project upward from the bracket 7 and into the path of arm 5 and are designed to limit the movement of said arm in either direction. These projections may be adjustable, if desired. A rest 9 extends in front of the stem 2 and serves to support the hammer when the same is removed from the strings "R" and "L". A finger 10 extends upward from the free end of the arm 5 and is preferably formed of a stiff wire which extends loosely through an actuating loop 11 projecting from one end of an inclined lever 12. This lever is fulcrumed upon a supporting strip 13 and is limited in its movement by stop projections 14. An anti-friction roller 15 is journaled upon that end of the lever farthest removed from the loop 11 and a spring holding strip 16 is designed to bear against one end of the lever so as to lock it in position against either of the stop projections 14. Suitably supported above the lever 12 is a selective cylinder 17 having teeth or projections 18 upon the periphery thereof adjacent one end. Thirteen of these projections are provided to correspond with the thirteen music keys which are designated in the "key" column of the chart shown in Fig. 15. The projections are spaced apart preferably at regular intervals and are designed to be engaged by a pawl 19 having a recess 20 in one face thereof into which any two adjoining projections are adapted to project at the same time. The lower end of the pawl is pivotally connected to an actuating rod 21 and arms 22 and 23 extend from this rod and from the pawl and are connected by a coiled spring 24 whereby the pawl is held normally in contact with the

periphery of roller 17. The pawl 19 may be actuated in several ways and in Figs. 1 and 3 I have shown means whereby, upon the depression of either of two pedals, the cylinder 17 will be rotated in either direction for a distance equal to the space between any two of the adjoining projections 18. In this mechanism the rod 21 is connected at its lower end to an elongated loop 25 into which loosely extends the free end of a lever 26 fulcrumed as at 27 upon a supporting rod 28. The other end of this lever has a hanger 29 secured thereto and provided with a pedal 30. Another lever 31 is fulcrumed at one end upon a support 32, as shown at 33, and the free end of this lever loosely extends into the loop 25 and normally rests upon the lower portion thereof. A pedal 34 is suspended from the lever 31 by a rod 35 and the two pedals 30 and 34 are preferably disposed close together so that they can be actuated by the same foot. A stem 36 projects downward from the loop 25 and loosely through one end of a rocking arm 37 which is fulcrumed as at 38 upon a support 39. An adjustable supporting spring 40 is mounted upon an arm 41 extending from the support 39 and exerts a constant upward pressure upon arm 37. An adjusting screw 42 is mounted in one end of the arm 37 and is designed to limit the movement of lever 31 and arm 37 and thereby enable a very minute adjustment of the parts to be obtained. It is obvious that by pushing down on the pedal 30 lever 26 will be actuated so as to push upward on loop 25 and rod 21 and cause the pawl 19 to push against the lowest projection 18 therein and rotate the cylinder 17 one-thirteenth of its circumference. By pushing down on the other pedal 34 lever 31 will pull downward on the loop 25 and rod 21 so that the pawl 19 will pull the uppermost projection 18 therein downward and cause the cylinder 17 to rotate one-thirteenth of its circumference.

Instead of using two pedals for actuating the selective cylinder a single pedal may be employed as shown in Fig. 4. It will be seen that this pedal which has been indicated at 43 is fulcrumed at a point between its ends upon a bracket 44 and has a stem 45 extending therefrom connected to a rod 46 which can be secured either directly to the rod 21 or to intermediate mechanism whereby the rod 21 can be positively actuated upward or downward by the rocking of the pedal. By pushing the pedal with the heel of the foot the stem 45 can be pushed upward and by pushing the treadle with the toe the movement of the stem can be reversed. In order that the stem may be locked in either position to which it may be shifted a spring tongue 47 is mounted adjacent thereto and has a projection 48 thereon designed to lap the stem and hold it either raised or lowered.

In addition to or in lieu of the foot-operated mechanism hereinbefore described means may be employed for rotating the cylinder 17 by hand. Such means has been shown in Figs. 1, 6, and 7 and consists of a gear 49 which is secured to one end of the cylinder so as to rotate therewith and meshes with a gear 50, the stem 51 of which has a button 52 whereby the stem and gears can be easily turned. An index 53 is secured to and rotates with the stem 51 and is designed to travel over a dial 54 on which are indicated the thirteen keys in the major, minor and Pythagorean scales. The keys of the major scale are indicated in the outer circle of the dial, the keys of the minor scale in the intermediate circle of the dial, and the keys of the Pythagorean scale in the inner circle. The parts are so proportioned that when the index is pointed to any one of the keys designated the selective cylinder will operate the parts in the manner hereinafter described to select the proper strings of each note to produce a just diatonic scale.

One lever 12 is provided for each note of the instrument and the selective cylinder 17 has means for actuating each of these levers at the proper time. Various lever actuating means may be employed but I preferably utilize cam-like projections 55 such as shown in Fig. 7, the same being spaced apart sufficient distances to permit the roller 15 to travel therebetween. One set of cam projections is provided for each lever and these projections are arranged in the relations shown diagrammatically in Fig. 16. By referring to this figure it will be noted that when the selective cylinder 17 is rotated so as to shift the levers into the key of "F sharp" all of the levers will be simultaneously actuated so that the hammers will be rocked laterally and strike the string "R". Upon shifting the cylinder 17 to the next key (B) all of the hammers will remain in the same positions except the hammer of the note "G sharp" which will be shifted to the "L" string of said note by the roller 15 coming into contact with the cam projection 56 indicated upon the chart 16. When the cylinder is shifted another point to place the hammers for producing a perfect scale in the key of "E" all of the hammers remain in the positions in which they were located for the key of "B" with the exception of the hammer of the note "C sharp" which will be moved to strike the "L" string instead of the "R" string. By examining the positions of the projections indicated in Fig. 16 it will be seen when the hammers are shifted, and in which direction, to produce perfect intervals in the various keys. In order that the selective cylin-

ger 17 may be held in any position to which it may be shifted a notch 57 is provided for each longitudinal column of cam projections and these notches are designed to successively receive a retaining roller 58 connected to one end of a spring arm 59.

It is thought that the operation of the apparatus disclosed in Figs. 1 to 7 inclusive will be fully understood in view of the foregoing description. If it is desired to shift the hammers so as to produce perfect intervals in the key of "C" major one of the pedals 30 and 34 is actuated so as to rotate the cylinder 17 until the index 53 points to the letter "C" in the outer or "major" circle of the dial 54. When the index assumes this position the cam projections upon the selective cylinder 17 will have actuated the hammers of the "D", "C", "F", "G", and "D♯" and "A♯" notes so as to strike the "L" strings, while the other levers will have been actuated to shift their hammers to strike the "R" strings. The keys of the instrument (which have not been shown) will then be operated to actuate the hammers and the proper tones will be sounded to produce just intervals. This operation is to be repeated for any key in which it may be desired to play.

It is of course apparent that when the lever 12 is swung upon its fulcrum the loop 11 will press against the fingers 10 and cause arm 5 to swing to the right or left and rock the stem 2 and hammer 1. The relative positions of the hammer and strings is shown particularly in Fig. 2. It is of course to be understood that Fig. 16 only shows the arrangement of cam projections for one octave. Said arrangement is to be duplicated along the cylinder 17 for every octave. Instead of providing a cam projection only at those points where the shifting of the lever is desired, thereby depending on the strip 16 for locking the lever in shifted position, ribs may be formed upon the cylinder, as shown at 60 for the purpose of positively holding the lever in shifted position.

Instead of utilizing a single hammer for both strings of a note one hammer may be provided for each string, as shown in Figs. 8 and 9. Of course where this construction is employed it is necessary to make each hammer and its actuating mechanism very thin so that two hammers and their mechanism can be contained within the space ordinarily occupied by one hammer and its mechanism. By referring to Fig. 8 it will be noted that the supporting rail 61 which extends throughout the width of the sounding board has brackets 62 extending therefrom and placed in staggered relation, each bracket constituting a support for a hammer 63 which is pivotally connected thereto. Each hammer is designed to be actuated by a jack 64 which is pivotally mounted upon a wippen 65 pivotally connected to the rail 61. A coiled spring 66 is interposed between each wippen 65 and one end of the jack 64 supported thereby and these springs serve to hold the jacks normally in engagement with the hammers 63. Each wippen 65 has a finger 67 extending therefrom and disposed to ride upon the selective cylinder 68 which is provided with a plurality of notches 69 designed to successively receive a spring-pressed retaining roller 70 similar to the roller 58 heretofore referred to. Projections 71 are formed upon roller 68 and are designed to travel beneath the fingers 67 so as to raise them simultaneously at predetermined intervals. Pivotally connected to each wippen 65 and depending therefrom is an abstract 72, and the lower ends of these abstracts are normally disposed above lugs 73 formed upon the inner ends of the key 74 utilized for actuating the hammers 63. One of these lugs is provided for each abstract 72 and a stop projection 75 extends from each abstract and is designed to contact with the end of the key to limit the swinging movement of the abstract in one direction. Each abstract has an aperture 76 therethrough through which extends a guide strip 77 pivoted to a bracket 78. These brackets are disposed in staggered relation and are connected to a supporting strip 79. The selective cylinder 68 has ribs 80 extending partly therearound, said ribs corresponding in arrangement with the cam projections or ribs 60 shown in Fig. 16. One of these ribs 80 is provided for each abstract 72. The projections 71 are so disposed as to lift the fingers 67 and levers 65 immediately prior to the shifting of either of the abstracts 72 by one of the ribs 80. It will be obvious that when the selective cylinder 68 is rotated to arrange the parts so that a predetermined string of the note will be sounded, one of the ribs 80 will move against one of the abstracts 72 and swing it back off of the lug 73 thereunder and simultaneously with this movement another rib 80 will pass from under the other abstract 72 so as to permit it to swing into position above one of the lugs 73. While this shifting of the abstract is taking place, the fingers 67 ride over the projections 71 so that both abstracts will be slightly raised and be free to pass easily on to or off of the lugs 73. When the desired adjustment has been effected the key 74 can be pressed and only that abstract 72 disposed upon the lug 73 will be actuated and therefore but one of the hammers will be moved. It is of course apparent that by properly arranging the ribs upon the selective cylinder 68 the shifting of said cylinder will cause the proper hammers throughout the several octaves of

the piano to be thrown into operative relation with the keys so that the proper intervals will be produced in a gamut in any key.

Instead of using two sets of hammers and operating mechanism for each note the construction shown in Fig. 11 may be provided. In this construction a single actuating hammer 81 is utilized and said hammer is designed to strike either of two auxiliary hammers 82, one of which is provided for each string "L" and "R". Each of the hammers 82 is pivotally connected to and extends downward from a lever 83 pivotally connected to a supporting rail 84 and yieldingly supported by means of a spring 85. A roller 86 is mounted upon each of the levers 83 and is designed to travel within a groove 87 in the selective cylinder 88. One of these grooves is provided for each lever 83 and it is apparent that by properly locating all of the grooves within the roller the proper levers 83 will be actuated so that only one of each pair of hammers 82 will be in position to receive a stroke from the hammer 81. The selected hammers will of course be the ones designed to sound the strings whereby perfect intervals may be obtained in the key to which the selective cylinder is adjusted. With this construction a holding roller 89 is provided for engaging notches 90 in the cylinder 88 and a rest 91 utilized for holding the hammers 81 when they are in inoperative position.

In Figs. 13 and 14 has been shown still another means whereby either of two tones may be sounded by the actuation of a single key. With this construction it is not necessary to use two strings or two hammers in order to get either of two tones upon the actuation of a single key. Instead a single string and hammer may be used and the change in tone produced by tensioning or relaxing the string mechanically in order to raise or lower the pitch thereof. For instance, the "C" string is normally tuned to 253 vibrations and by means of mechanism employed this string can be further tensioned so that 256 vibrations may be produced to obtain the desired tone when the string is sounded. The mechanism provided for this purpose consists of a block 92 which rests upon the string 93 adjacent the post 94, said string being preferably mounted on a roller 95 carried by the bridge 96. Block 92 has a recess 97 into which projects a heel 98 formed at one end of a lever 99. The lower end of this lever projects past the string 93 and carries a roller 100 designed to bear upon the under portion of the string. Lever 99 is slit longitudinally to form two arms 101 and 102. The arm 101 carries a roller 103 designed to bear against the selective cylinder 104 while the arm 102 carries a small guide roller 105 also designed to bear upon the cylinder 104. An adjusting screw 106 extends through arm 102 and bears against arm 101 and by means thereof the relation of the two rollers 103 and 105 can be regulated. The selective roller is provided with a series of grooves 107 in its periphery, one groove being provided for each roller 103 and it is obvious that when the roller 103 moves into one of these grooves the pressure of the block 92 upon the string will diminish and said string will be slightly slackened. This inward movement of the roller 103 is limited by roller 105. When roller 103 moves out of its groove 107 it pushes downward on the block 92 and pulls roller 100 upward against the string and therefore said string is slightly tensioned so that the number of vibrations produced will be increased.

It will be apparent from the foregoing description of the various constructions embodying this invention that a just gamut can be played in any key simply by turning the selective cylinder of the apparatus until the proper key is designated thereby and said cylinder will serve to actuate the parts so that either of two tones of each note will be sounded upon the actuation of the hammer, the proper tones being selected in each key so that the correct intervals will be obtained. In this way instead of producing imperfect intervals by tempering in the usual manner by scattering the comma throughout the gamut a just or natural gamut can be produced in any key simply by including the didymus comma between the two tones of each note and causing either of said tones to be produced according to the key in which the same is to be played.

The apparatus can be readily adapted to pianos and because of its compact nature will not require much room within a case.

In the construction shown in Fig. 8 any suitable means may be interposed between the jacks 64 to prevent them from binding upon one another and interfering with the action of the mechanism. It is to be understood also that in the form of mechanism shown in Fig. 11 any suitable sound-deadening means such as a strip of felt or leather may be substituted for each hammer 82.

In the claims the term "comma" is used to designate the didymus comma having the ratio of 81/80.

What is claimed is:

1. A musical instrument having two sounding bodies for each note, said sounding bodies being tuned to produce tones separated by the interval of a comma, a laterally movable member pivotally mounted adjacent the sounding bodies, a hammer carried thereby for sounding the sounding bodies, and a selective device for actuating said member to shift the hammer into position to strike either sounding body.

2. A musical instrument having two sound-

ing bodies for each note, said sounding bodies being tuned to produce tones separated by the interval of a comma, a laterally movable member pivotally supported adjacent the sounding bodies, a hammer supported thereby and movable therewith, a selective device, and means operated by the movement of said device for shifting the said member and positioning the hammer to strike either of the sounding bodies.

3. A musical instrument having two strings for each note, the two strings being tuned to produce different tones, an element pivotally supported adjacent the strings, a hammer carried thereby, a selective device, a lever shiftable by said device for moving said element to position the hammer to strike a predetermined string.

4. A musical instrument having two strings for each note, said strings being tuned to produce different tones, a hammer pivotally supported adjacent the strings, an arm movable with and disposed to move the hammer to position it to strike either of said strings, an actuating lever, engaging means upon the lever and arm for transmitting motion from the lever to the arm, and a selective device for shifting the lever to shift the hammer.

5. A musical instrument having two strings for each note, said strings being tuned to produce different tones, a hammer pivotally supported adjacent the strings, an arm movable with and disposed to move the hammer to position it to strike either of said strings, an actuating lever, engaging means upon the lever and arm for transmitting motion from the lever to the arm, a selective device for shifting the lever to shift the hammer, and means for locking the lever and hammer in adjusted position.

6. A musical instrument having two strings for each note, said strings being tuned to produce tones separated by the interval of a comma, a pivotally supported hammer adjacent to and disposed to strike either of the strings, a selective device, and a lever actuated by said device for shifting the hammer into position to strike either string.

7. A musical instrument having two strings for each note, said strings being tuned to produce different tones separated by the interval of a comma, means for striking either string of each note, mechanism for shifting said means into position to strike a predetermined string of each note, and a selective device for actuating said mechanism of each note, said device comprising a revoluble cylinder, and separate series of projections upon said cylinder for operating the respective shifting mechanism.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK SITTON.

Witnesses:
W. B. TOWNSEND,
J. S. PATTON.