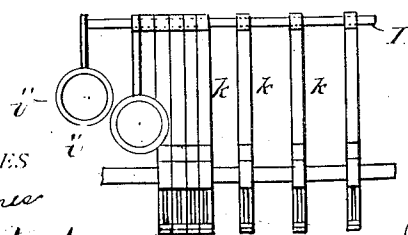
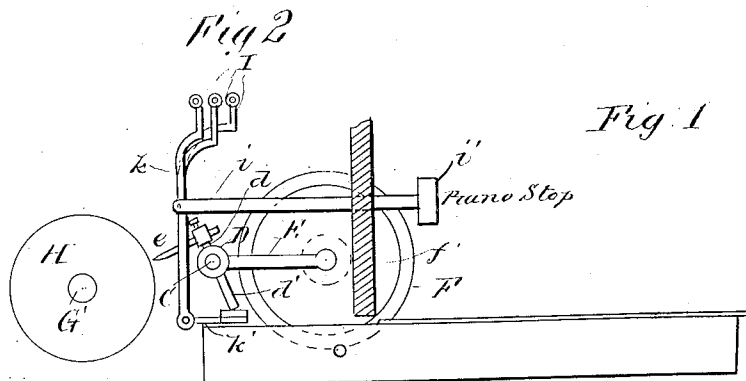
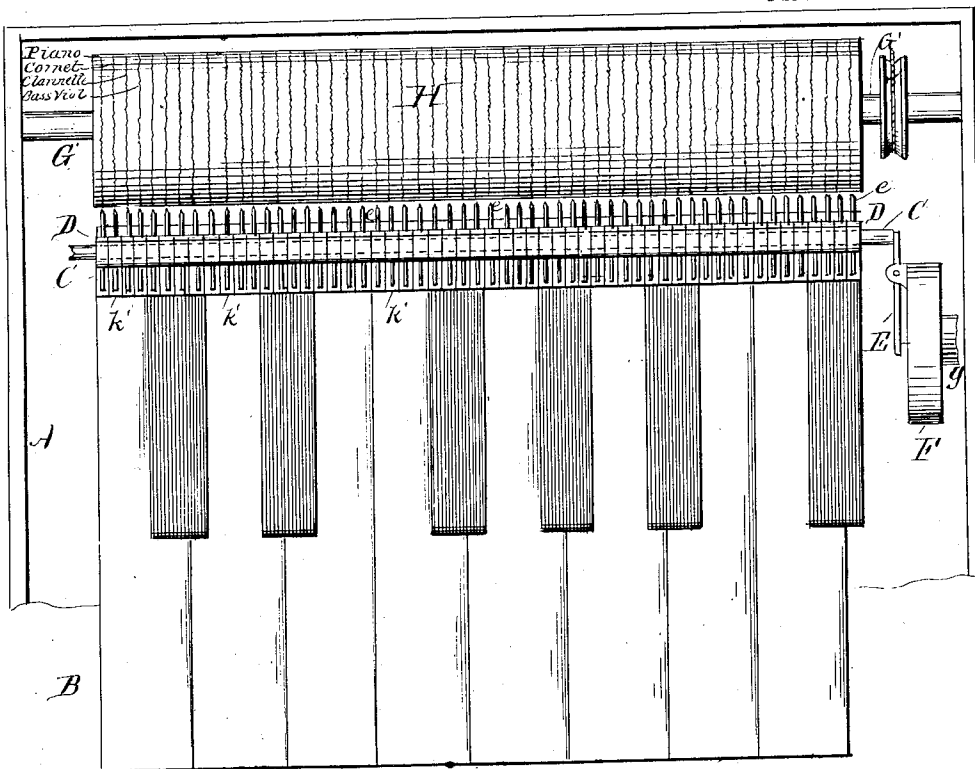


No. 851,634.

PATENTED APR. 23, 1907.

T. A. & J. B. CONNOLLY.
MUSICAL INSTRUMENT.
APPLICATION FILED JAN. 23, 1907.

2 SHEETS—SHEET 1.



WITNESSES

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2 SHEETS—SHEET 2.

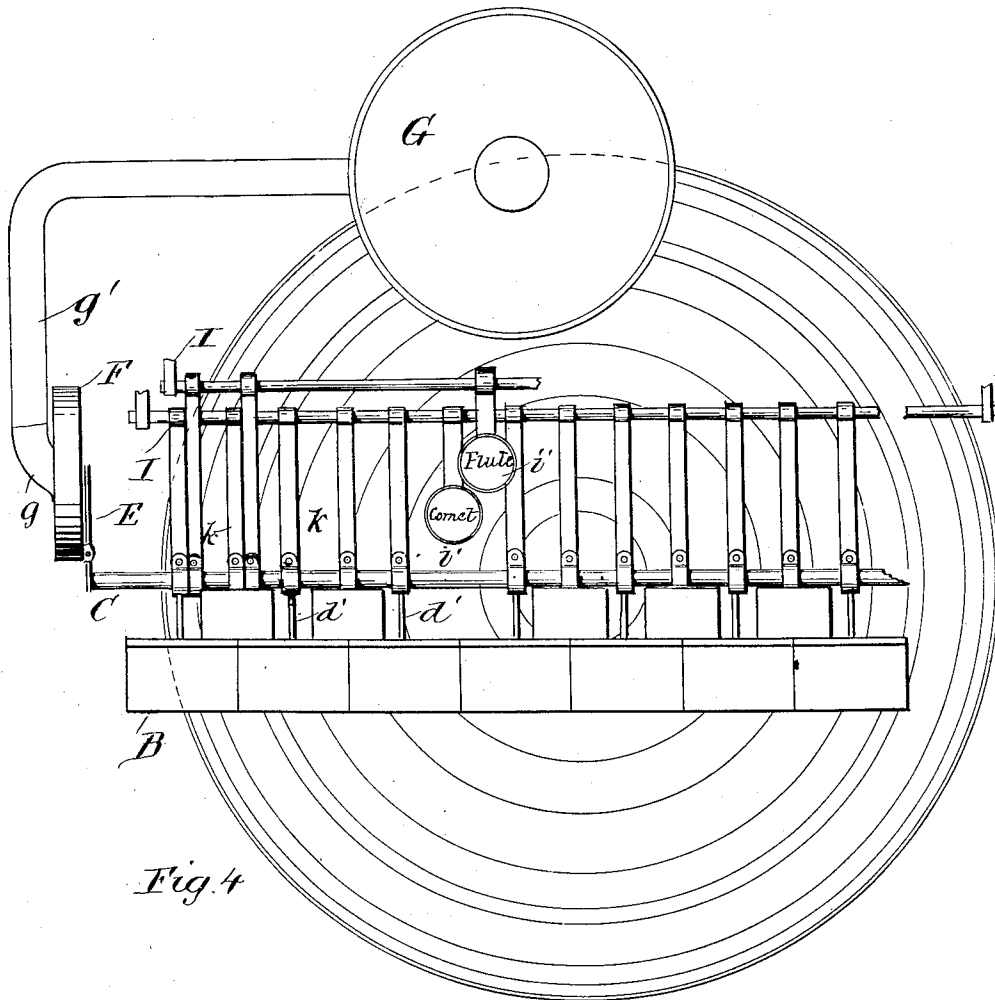


Fig. 4

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THOMAS A. CONNOLLY AND JOSEPH B. CONNOLLY, OF WASHINGTON,
DISTRICT OF COLUMBIA.

MUSICAL INSTRUMENT.

No. 851,634.

Specification of Letters Patent.

Patented April 23, 1907.

Application filed January 28, 1907. Serial No. 354,485.

To all whom it may concern:

Be it known that we, THOMAS A. CONNOLLY and JOSEPH B. CONNOLLY, citizens of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification.

This invention has relation to musical instruments and has for its object the provision of an instrument, in which the principle of the phonograph or graphophone is applied to the production of the tones of the musical scale by the movement of keys, as in the piano forte, organ, or other key board instrument.

This invention has for its further object, the provision of an instrument, in which the tones of the musical scale represented by sound grooves or undulating lines, as in the phonograph or graphophone, may be produced or played either by hand, and according to the skill and taste of the performer or by automatic means.

This invention has for its further object, the provision of an instrument, embodying the principles of the phonograph or graphophone, whereby the tones of different kinds of musical instruments may be reproduced in any desired sequence or combination to produce melodies, airs, chords, harmonies or other musical effects, by manual performance on a key board or by devices, similar to those in use for the automatic playing of music on pianos, organs, and other key board instruments.

The instrument embodying our invention is preferably a key board instrument of the Clavier type, that is with the key board constructed and arranged as in the piano forte for the production of tone and semitone intervals according to the chromatic scale and the tone capacity compass or range may be of any desired extent. The tones or musical sounds are produced by the vibration of a diaphragm or diaphragms by a stylus or styluses operated by the undulations of sound grooves, or lines formed on a disk or disks, cylinder or cylinders, the appropriate stylus or needle for each tone being brought into operative relation to the proper tone groove by the depression of its corresponding key. The sound grooves, instead of being

spiral or volute are closed circles, each groove being adapted to produce a single note or tone and to continue sounding said note or tone so long as its stylus is in contact with it. In a tone scale-producing cylinder the sound grooves which are preferably those having lateral undulations, are located at regular intervals along the surface of the cylinder and the grooves for any given instrumental reproduction are at equal distances apart. The styluses or reproducing needles for all the different notes or tones are either mounted on a single sound transmitting rod or on different rods, the end or ends of which are in close contact with the lever or levers or a sound box or sound boxes, having suitable diaphragms, or said needles are carried respectively by vibratory levers mounted on separate sound boxes and accordingly as each stylus or needle for a given tone is operated by a different key from that of the others, any tone or combination of tones will be produced, according to the number and order in which the keys are struck. And if the sound grooves in the cylinder are all records of the same instrument, as for instance, a piano, the playing of the instrument as in playing a piano will produce the same tones as the piano. Moreover, if the cylinder have recorded on it, in the order of the musical scale, the tones of different instruments choral or orchestral effects are producible and the tones of any two or more instruments may be combined, "stops" being provided for bringing into requisition and eliminating the tones of the different instruments, as required.

In addition to the features above recited, provision is made for changing or transposing the key of the music so that any air or melody may be played in any desired key.

In the accompanying drawings; Figure 1 is a vertical transverse section of an instrument embodying our invention. Fig. 2, is a horizontal section or plan view. Figs. 3 and 4 are detail views, the latter being a modification.

A designates a casing or cabinet having the key board B, with the keys arranged in the usual order of white and black keys, representing, according to the conventional method, the tones and semitones of the chromatic scale. These keys are pivotally

mounted as in a piano or organ. Above the inner ends of the keys is arranged a horizontal rod C, on which are mounted, the levers D, having the arms d , d' , of which the arms d , carry the styluses or reproducing needles e . The rod C is arranged with its ends in contact with or attached to the lever E, of the sound box F, having diaphragm f' . The sound box is supported by the framing of the instrument, and has a tube g , leading from its rear side to a sound conveying tube g' , provided with a trumpet G.

H designates the sound reproducing cylinder mounted on an arbor G' , and preferably removable therefrom as in phonographs. The arbor G' is rotated by any suitable power, but, for the purposes of our invention, we prefer a pedal movement and suitable intermediate mechanism, including a speed governor, so that the power may be under the control of the performer on the instrument, as in operating the bellows of an organ or melodeon. Springs, weights or other automatic power mechanism may be used when desirable.

The sound grooves in the cylinder H are closed circles, and are produced in the original or master cylinder, by rotating the recording cylinder in a circle without longitudinal feeding during the operation of recording. Each groove is produced by the action of the stylus of a recording diaphragm, while the cylinder is making a single revolution during the vibration of the diaphragm under the influence of a single prolonged tone, and the several grooves are the records of the tones of the musical scale, in proper sequence. When the cylinder bears only the sound records of a single instrument, as of a piano, or organ, the grooves will be located at regular intervals corresponding to the distance between centers of keys. When the cylinder bears the record grooves of several different kinds of instruments, the grooves representing the same note or tone of the scale will be grouped side by side and the rod C will carry as many levers D as there are notes or tones. As each key is intended to produce, when struck, the same tone of each instrument represented on the cylinder, the tones are produced as required by means of "stops," the mechanism for which is similar to that employed in organs. A "stop" for our instrument may consist of a frame I with which is connected the rod i , leading to the front of the instrument and having a knob i' within easy reach of the performer as in an organ. This frame which is either adapted to slide or turn on pivots, is provided with a series of hangers k , located back of the inner ends of the keys, and having at their lower ends, tongues k' projecting forward and above the upper surface of the keys. These tongues are preferably pivoted to the hang-

ers. When a "stop" is not in use, the tongues k' are retracted, the knob and stem of the stop mechanism being pushed in so that the keys may be struck and their rear ends elevated without touching the stylus levers. When however a stop is drawn out, the tongues carried by its frame I are brought between the keys and the stylus lever and when the keys are struck, the tongues are raised thereby, and thus come in contact with and raise the downwardly extending arms d' of the levers D, thus turning the levers on the rod C and causing the reproducing needles carried thereby to enter the record grooves in the cylinder H, corresponding to the pulled stop. As the cylinder H is in constant rotation during the playing of the instrument, the tone produced by the depression of a key will in the production of some tones be prolonged while the key is held down. Very unique and strikingly novel musical effects however will be produced by prolonging the tones of certain instruments, hitherto unappreciable and in fact impossible, except as staccato tones, and when this prolongation of tones is desired the cylinder will bear sound grooves produced from the tones of percussion or plucked instruments, and stops will be provided which will prolong such tones as long as a key is held down.

In an instrument having an extended or full key board such as that of a piano or organ, it will not be necessary to provide the same compass for each system of tones. Thus the sound grooves for the cornet need only be sufficient to take in the usual compass of this instrument and its register may be the same as that of the cornet, in other words the system or arrangement will be similar to that of the organ.

Instead of using grooved cylinders, we may use one or more flat disks as shown in Fig. 3.

The instrument embodying our invention is adapted to the reproduction of any sounds capable of being resolved into a musical scale and therefore the tones producible by the human voice and recorded on the cylinders or disks may be reproduced as songs, airs or melodies without words.

Having described our invention, we claim and desire to secure by Letters Patent:

1. A sound reproducing instrument, comprising tone records of different instruments, constituting a plurality of scales of coincident register and means for reproducing from said records their respective tones, separately or in any musical relation.

2. A sound reproducing instrument comprising a series of tone records arranged in the order of the musical scale, and comprising a plurality of scales of coincident register and means for performing on said instrument and reproducing said tones according to the usual musical sequence and relation.

3. A sound reproducing instrument comprising records of the tones of a plurality of musical scales of coincident register and means for selecting and reproducing any individual tone or tone sequence or combination.

4. A sound reproducing instrument comprising records of separate musical tones grouped to form a plurality of scales of coincident register, a key board and means for reproducing tones by operating the keys on the instrument.

5. A sound reproducing instrument, comprising records of separate musical tones grouped in coincident scales, means for reproducing said tones, a key board through which said reproduction is controlled and means for coupling the reproducing means of each scale to a common key board.

6. A sound reproducing instrument, comprising records of the tones of a plurality of musical instruments of different quality or timbre, disposed respectively in the order or sequence of the musical scale, the tones of one scale coinciding in pitch or register with tones of another scale and means for reproducing any of the recorded tones.

7. A sound reproducing instrument, comprising records of the tones of different instruments, a key board through the medium of which the tones are reproduced at will, reproducing means controlled by said key board, and stops for bringing the different series of records and their reproducing de-

vices into responsive relation to the key board, and removing them therefrom.

8. A sound reproducing instrument, comprising sound records, a plurality of reproducing needles or styluses, a sound reproducing diaphragm, means for communicating the vibrations of the needles to the diaphragm, and means for bringing any needle in contact with its appropriate record line or groove.

9. In a musical instrument means comprising phonographic records and reproducing devices for simultaneously reproducing tones of a plurality of different musical instruments in unison.

10. A musical instrument comprising several scales of phonographic, single tone, records of different instruments, tones of one scale being reproducible in unison with tones of another scale.

11. A musical instrument comprising several scales of phonographic, single tone, records of different instruments, tones of one scale being reproducible in unison with tones of another scale and means for bringing the different series of records into operation simultaneously or individually.

In testimony whereof we affix our signature, in presence of two witnesses.

THOMAS A. CONNOLLY.

JOSEPH B. CONNOLLY.

Witnesses:

CLYDE B. WEIKERT,

I. P. HINES.