

A. K. VIRGIL.

EXERCISING DEVICE FOR MUSICIANS.

No. 344,462.

Patented June 29, 1886.

Fig. 1.

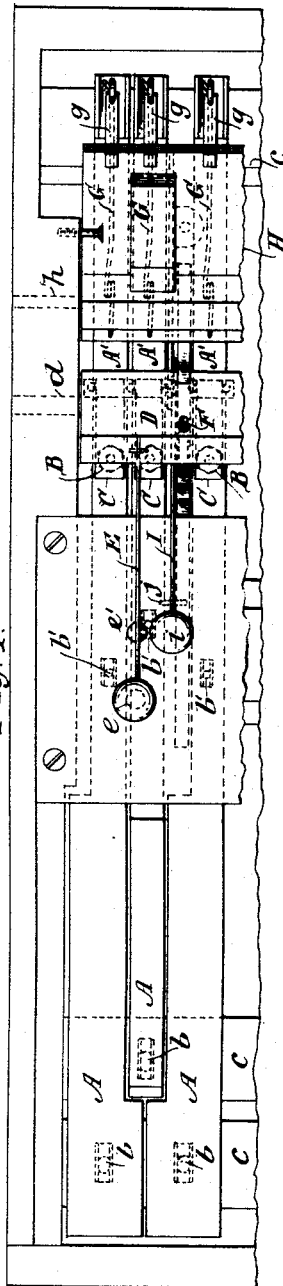


Fig. 2.

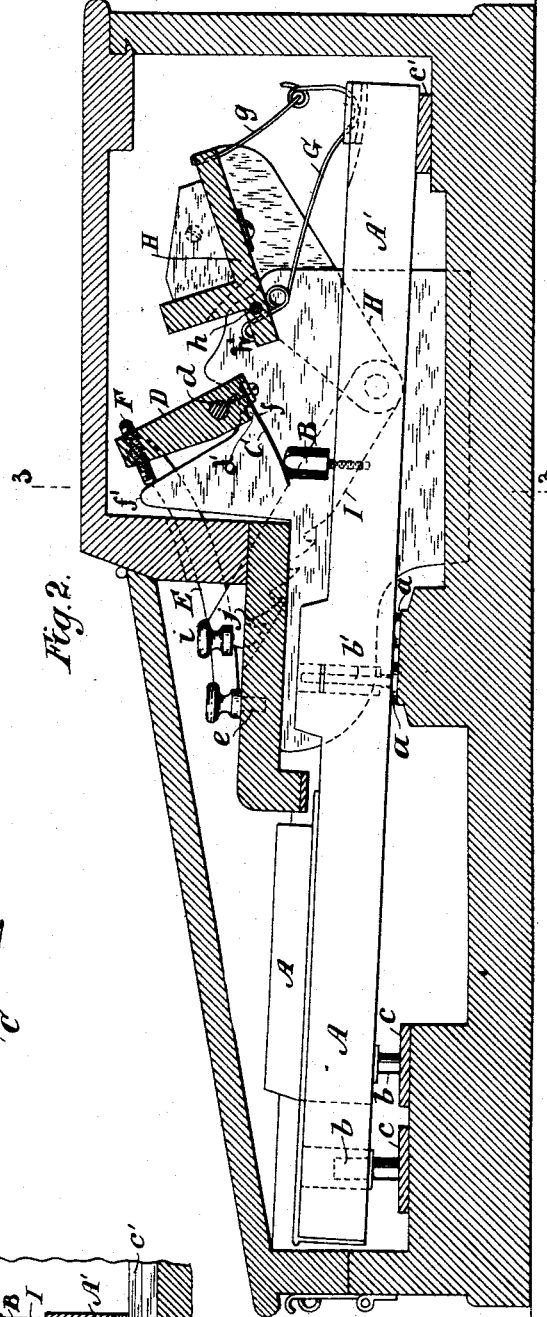


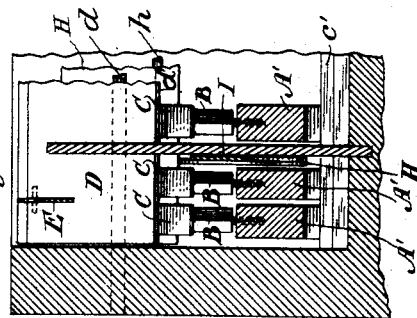
Fig. 4.



Fig. 5.



Fig. 3.



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EXERCISING DEVICE FOR MUSICIANS.

SPECIFICATION forming part of Letters Patent No. 344,462, dated June 29, 1886.

Application filed June 6, 1885. Serial No. 167,811. (No model.)

To all whom it may concern:

Be it known that I, ALMON K. VIRGIL, a citizen of the United States, residing at New York city, in the county and State of New York, have invented an Improved Exercising Device for Musicians, of which the following is a specification.

In an application already on file in Patent Office, Serial No. 84,340, renewed October 22, 1884, as Serial No. 146,164, I have described an instrument intended to be used in the instruction of pupils on the piano or organ, and in practicing piano and organ music and exercise.

Having more fully developed and improved the system and instrument, the object of my present application is to secure said improvements and also certain features which were not fully set forth in said application.

My present invention may be embodied in an instrument like that illustrated in the drawings, which drawings are supposed to be on a scale of about eight inches to the foot.

Figure 1 is a plan view showing the interior arrangement of the instrument to the extent of three keys and their connected parts. These keys and the connected parts will of course be duplicated in a practical instrument to the extent necessary to produce a complete key-board. Fig. 2 is a side view of a section of the same thing shown in Fig. 1. Fig. 3 is a sectional end view through the line 3 3 of Fig. 2. Fig. 4 is a top view of the speaking-spring, and Fig. 5 is a side view of the same.

A A A are keys like those of an ordinary piano, which extend beyond a fulcrum, *a*, as at A', the position of the fulcrum being so arranged that the weight of the end A' slightly overbalances the weight of the end A, as in an ordinary piano. These keys A and the extensions A' and their fulcrum are in fact constructed and arranged in all respects like the corresponding parts of an ordinary piano.

The pins *b b'* (shown in dotted lines) serve as guide-pins to maintain the position of the key, and the cushions *c c'* serve to limit the extent of motion.

For producing the sound a speaking-spring is employed. A speaking-spring, broadly, is an old contrivance, and it is possible to use in

my instrument speaking-springs of the kind heretofore known. In attempting to do so, however, great difficulty will be experienced in selecting speaking-springs which give the sound at the proper instant, and especially at the proper instant relatively to each other. To obviate this difficulty I have invented a speaking-spring and a method of regulating the instant at which it produces sound. It is unnecessary to describe this spring in the present application, since it is fully described, and also the method of producing it, in an application filed simultaneously herewith, to which reference is made. I will, however, state the positions in which the key should be at the instant that the spring speaks. The object is to have the spring speak at the point in the downward travel of the key where, in a piano, the damper is lifted from the string and the sound commences, and the object further is to have the spring speak a second time on the upward travel of the key at the point where the damper of a piano returns onto the string, so as to stop the vibration and sound. In a piano the damper is lifted from the string when the key has descended about two-thirds of its complete descent, and the damper is returned to the string when the key has ascended about two-thirds of its upward or return movement. Therefore in my instrument the spring is arranged to speak at the corresponding points in the travel of the key, and it is obvious that for that purpose the spring must be made so as to speak at a different point on being compressed from that at which it speaks on being released. Furthermore, the springs of all the keys must be arranged so as to speak at the same point in the travel of the key, both on the downward and upward travel of the key.

Having constructed or selected a sufficient number of springs with reference to being properly made, each of them may be secured and arranged in the machine as follows: A stud or button, B, is placed upon the extension A' of the key and secured thereto, preferably by a screw, so as to be capable of a vertical adjustment. C is the speaking-spring, the free end of which rests upon the top of the stud B, as shown, and the confined end of

which is clamped to the edge of a rail or lever, D, (which is cut away, as shown at *d'*, so as to allow the indentation of the speaking-springs to act to produce the sound,) pivoted at *d*, and extending from one end of the instrument to the other, so as to support the speaking-springs of all the keys in the position shown. A rod, E, is pivotally connected to the opposite arm of the rail or lever D, and terminates in a knob provided at its bottom with a pin, *e*, which is adapted to enter holes *e'* in the frame above the keys. It will be observed that when this pin *e* is in the position shown in Fig. 2 the spring C will be held about in contact with the top of the stud B when the key A is at the top of its stroke; but when the pin *e* is removed from the position shown in Fig. 2 and inserted into the hole *e'*, Fig. 1, the speaking-spring C will be thrown upward out of contact with the stud B. By this arrangement it is in the power of the operator at any time, by moving the pin *e*, to use the keys without any sound whatsoever. The prop *f'* prevents the lever D from being moved too far in that direction. The speaking-springs C, when unconfined, will generally have a slight downward inclination between the end which is to be confined and the free end; but when the lever D is in the position shown in Fig. 2, prepared for the operation of the speaking-springs, each spring will be slightly under compression from the stud B, so as to give the free end a slight upward inclination, as shown in Fig. 2. The confined end of the spring is not pierced by any securing device, but is preferably simply clamped to the edge of the lever D by a plate or wood slip, which is held in place by screws inserted between the several springs, as shown in Fig. 1. This plate or wood slip is located with reference to each spring, so as to confine each at a corresponding distance back from the indentation which produces the sound, and which occurs in the instrument that I have represented in the drawings at about the point indicated by the letter *f* in Fig. 2.

In addition to the arrangement for sustaining the speaking-spring already described, it is desirable to provide the instrument with a contrivance for regulating the amount of pressure necessary to bring to bear upon the keys to compress them. This I do by means of a bridled spring, G, which is formed as shown in Fig. 2, and held in position so as to bear upon the extreme end of A'. It is secured to one arm of a lever, H, at *h'*, and from another arm of the same lever the opposite end of the spring is suspended by means of a flexible connection, *g*, which I preferably make of leather. The lever H has its fulcrum at *h*.

To the lever H is pivotally connected the rod I, as shown in Fig. 2, which projects upward and backward through a slot in the frame, and terminates in a knob, *i*, by which it is moved by hand. In the under side of this rod are formed notches suitable to engage

with a pin, *j*, extending across the slot in which the rod I moves through the frame.

It is obvious that the operator, by the arrangement which is described, may control the pressure of the spring upon A', for by withdrawing the rod I and engaging the pin *j* with the notch succeeding the one in which it is engaged in Fig. 2 he may compress the spring G and cause it to bear more heavily on A', the flexible suspender *g* at the same time being slackened. Furthermore, by disengaging the pin *j* from the notch in the rod I, with which it is shown as engaged in Fig. 2, and moving the rod forward, the operator may throw the spring G upward, so that it does not rest upon A' at all. The length of the suspender *g* for each spring is regulated so that every spring is lifted off of A' at the same instant, and so that every spring bears with exactly the same pressure upon A'. The lever H extends through the instrument from one end to the other, and all the springs G are attached to it, so that only one rod I is required for the whole instrument.

It will be observed that in this instrument the speaking sound will be produced both on the downward and upward motion of the keys—that the point at which the speaking sound occurs will correspond with the points at which the tone of the musical instrument would commence and cease. It will also be seen that this instrument may be used without speaking by throwing the springs out of contact with B, and that the pressure required for compressing the keys may be varied to almost any extent.

The keys possess the action of genuine piano-keys, and give forth a sound when struck, and also when the finger leaves the key—the same sound for all the keys—similar to the click made by the modern castanet.

One great advantage in this instrument is the ease and certainty with which by its aid a legato and staccato touch can be acquired. Legato playing, for example, requires that in a succession of tones the second tone should begin at the precise instant when the first one ceases. There must be no break between or offensive lapping. In order to produce this the fingers must be so trained that the first finger shall leave the key at the exact instant when the second strikes its key.

Since in this instrument the keys give forth sound when they rise as well as when they fall, if one is released before or after the other is struck, the error is at once made evident by the sounds of the speaking-springs not being simultaneous.

I have described what I understand to be the most useful form of instrument; but I am aware that it may be varied in many ways without departing from the principle of my invention. I therefore do not limit myself to the form shown.

In this application I do not claim, broadly, the combination, with a series of keys, of a

series of sound-producing devices producing sounds on the down and up movement of the keys, that being claimed in another application, Serial No. 174,083, renewed August 10, 1885, being the same one originally filed as Serial No. 84,340, February 8, 1883, and renewed October 22, 1884, as Serial No. 146,164; nor do I claim the construction of the speaking-spring herein shown and described, that being the subject of another application filed June 6, 1885, Serial No. 167,842.

I am aware that a series of keys having counterbalance-extensions have heretofore been combined with a series of non-sound-producing springs, the free ends of said springs resting on the said counterbalance-extensions for the purpose of causing the keys to return after being depressed. I therefore do not claim this combination, broadly, in claim 5, but only when the springs are so constructed as to perform at the same time the double purpose of pressure-springs and sounding-springs.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a series of keys, of a series of sound-producing devices adapted to produce a short, quick sound—not a musical tone—arranged in position to be operated by the depression of the keys, substantially as described, whereby each excursion of each key produces two distinct sounds, occurring at the same points in the travel of the respective keys, and one sound occurring in the travel of the key where, in a musical instrument, the musical tone would commence, and the other sound where the musical sound would cease.

2. The combination, with a series of keys, of a series of springs, G, each of which springs has the motion of its free end limited by a flexible suspender, g, substantially as described.

3. The combination, with a series of keys, of a series of speaking-springs arranged in position to be operated on the depression of the keys, and a series of other springs, G, having the extent of motion of their free ends limited by flexible suspenders, substantially as described.

4. The combination, with a series of keys, each of which possesses a counterbalancing-extension, A', of a series of springs, G, in contact with said extensions A', and arranged upon a bar extending transversely through the instrument, said bar being connected by means of its extension H with the lever I, so formed as to be held stationary at different points, whereby the spring-sustaining bar may be rocked and held in any desired position.

5. The combination, with a series of keys having counterbalance-extensions A', of a series of speaking-springs arranged above such counterbalance-extensions, the free ends of said speaking-springs resting on said counterbalance-extensions, and tending by their elasticity to press the said keys down upon their respective fulcrums as the keys are depressed, whereby the touch afforded by said keys is assimilated to that of a piano.

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Witnesses:

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