No. 679,692. Patented July 30, 1901.

A. C. BERGMAN.

PRACTICE CLAVIER.

(Application filed July 30, 1900.)

(No Model.)

FIG. 1

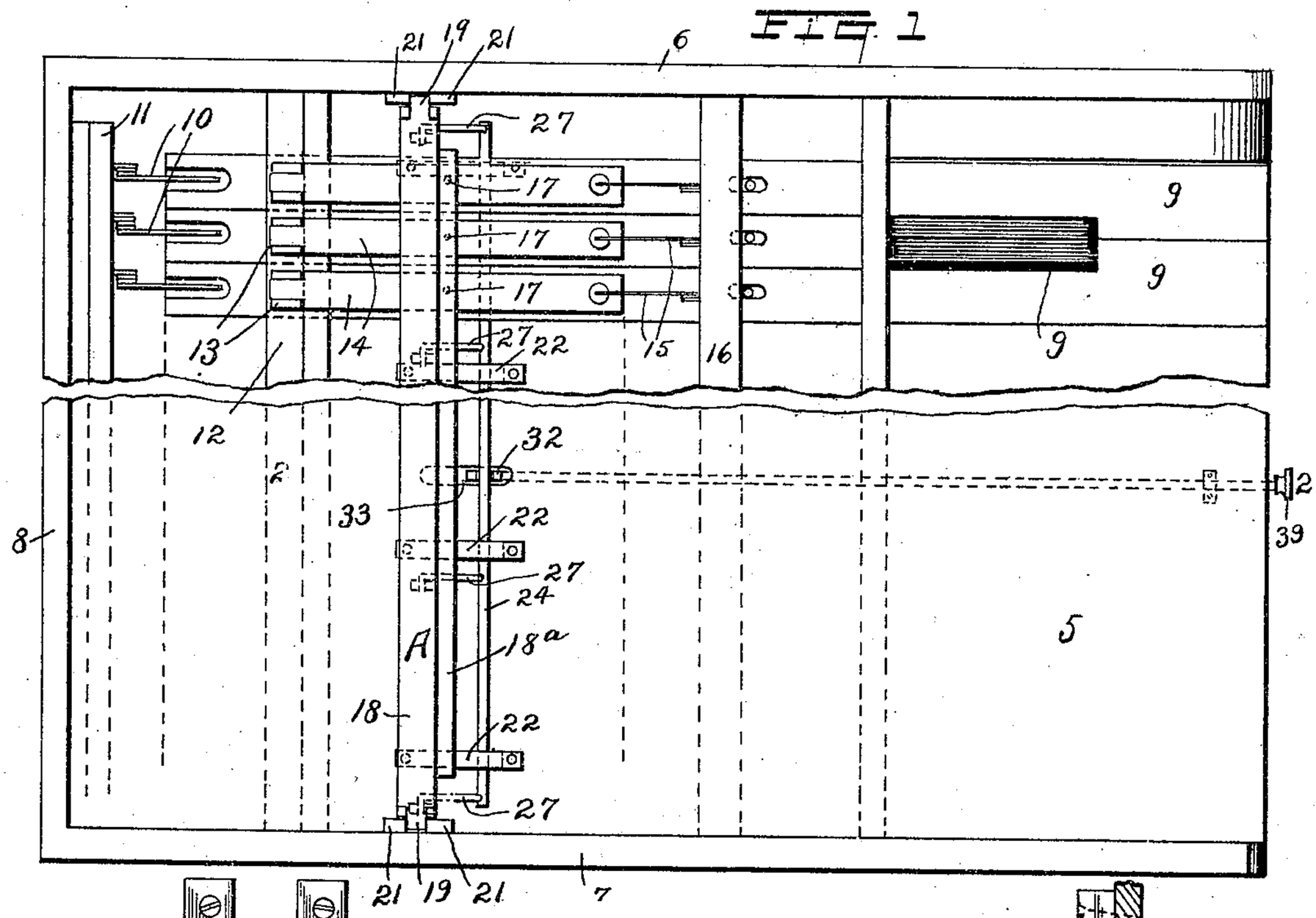


FIG. 4

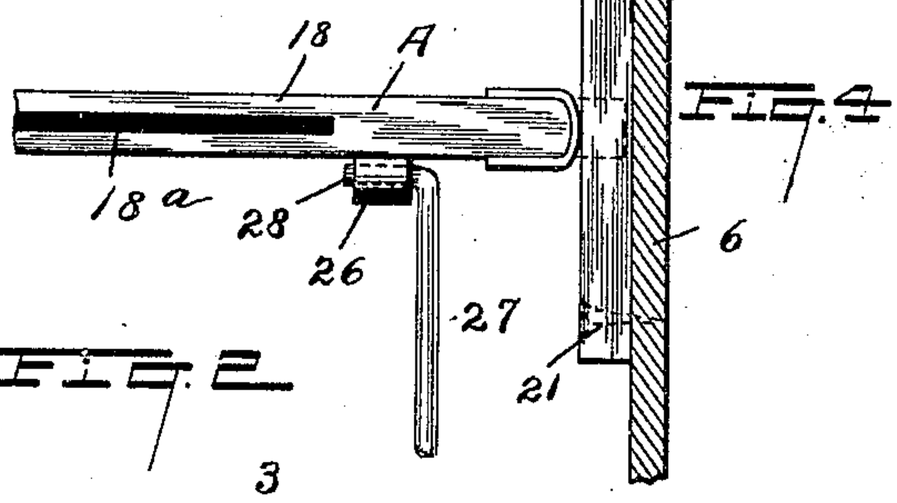


FIG. 2

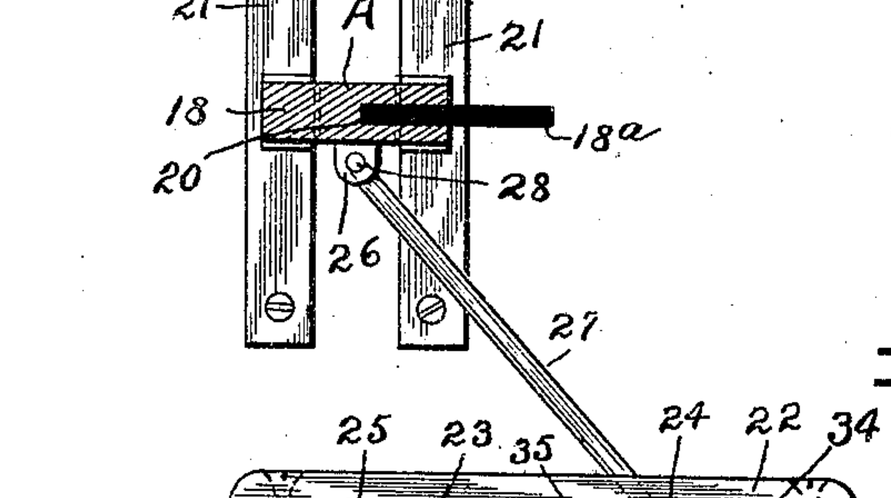
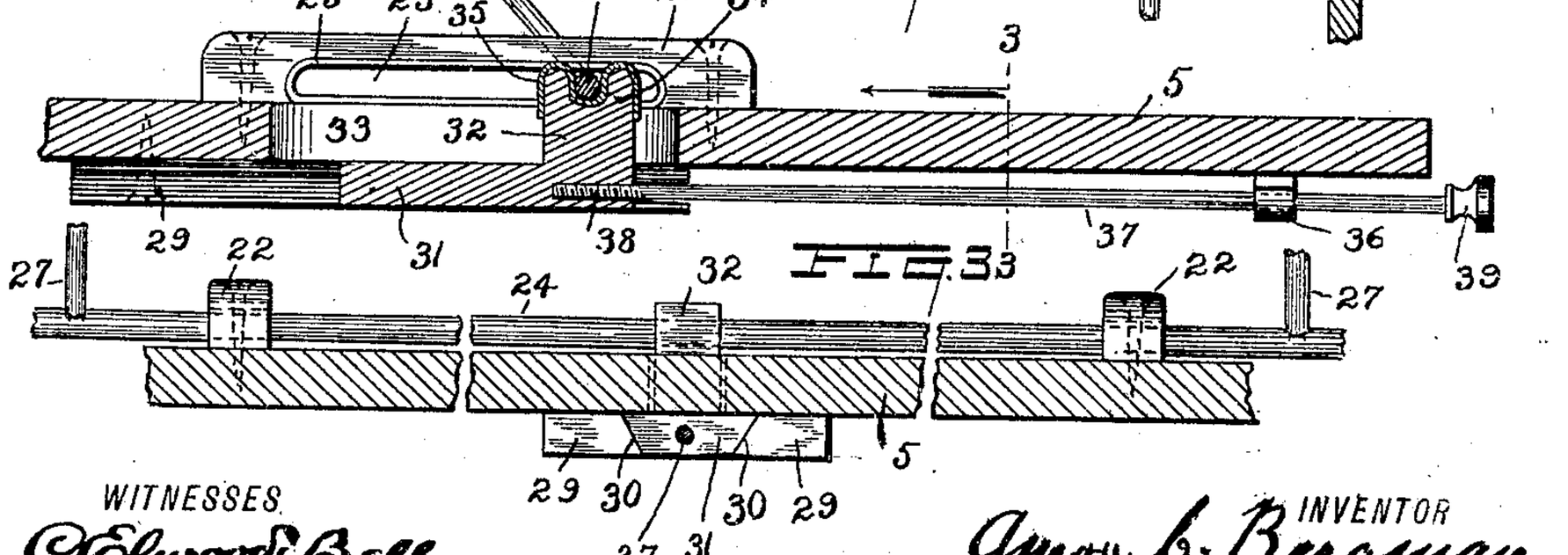


FIG. 3



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UNITED STATES PATENT OFFICE.

AMOS C. BERGMAN, OF NEW YORK, N. Y., ASSIGNOR TO ANTHA M. VIRGIL, OF SAME PLACE.

PRACTICE-CLAVIER.

SPECIFICATION forming part of Letters Patent No. 679,692, dated July 30, 1901.

Application filed July 30, 1900. Serial No. 25,289. (No model.)

To all whom it may concern:

Be it known that I, AMOS C. BERGMAN, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Practice-Claviers, of which the following is a clear and full specification, such as will enable those skilled in the art to make and use the same.

This invention relates to practice-claviers; and the object thereof is to provide certain improved features of practice-clavier action pertaining particularly to the sound-producing element and the means for adjusting the same into and out of operative position with relation to the striker devices, which are actuated by the keys.

The present invention will be more readily comprehended and its exact position in the art determined by referring to another application for United States Letters Patent, Serial No. 19,123, filed by me the 5th day of June, 1900, and upon the subject-matter of which prior application the present invention constitutes an improvement.

In the accompanying drawings, which form part of this specification, and in which like reference characters denote like parts in the several views, Figure 1 is a plan view, centrally broken away, of a practice-clavier action and the casing thereof, several of the parts in duplicate being omitted for the sake of clearness, the whole showing the essential features of the present invention. Fig. 2 is a longitudinal detail section thereof upon the line 2 2 of Fig. 1, the sounding element and means for adjusting the same alone being shown. Fig. 3 is a section of Fig. 2 upon the line 3 3 thereof looking in the direction of the arrow thereto appended. Fig. 4 is a partial front elevation of Fig. 2, showing a front edge view of the sounding element. Figs. 2, 3, and 4 are upon an enlarged scale.

Referring more particularly to the drawings, I have shown at 5 the bottom member and at 6 and 7 the side members and at 8 the rear member, respectively, of the casing or frame of the action of my improved practice-clavier.

In Fig. 1 are shown at 9 several of the keys, which are arranged in any desired manner and suitably balanced, as well understood by those familiar with the art. At their rearward ends the keys are borne upon by spring-fingers 10, secured to a touch-bar 11, which ranges transversely of the keys and at the rear thereof. A support-rail 12, suitably supported, also ranges transversely above the keys 9, and pivotally supported thereby at 13 are the hammer elements 14, which range in parallelism with and above the keys and are borne upon at their forward ends by spring-fingers 15, secured to a spring-bar 16, which ranges transversely above the keys, being supported by the side frame members 6 and 7. The construction and arrangement of the keys, hammer elements, support-rail 12, touch-bar 11, and spring-fingers 10 and 15 are immaterial to the subject-matter of the present invention and are fully described in the prior application above referred to. The hammer elements are, it is understood, provided each with one or more striker devices, there being shown in the drawings one for each hammer element—namely, at 17 in dotted lines in Fig. 1.

In the practice of my invention I provide an improved sounding element (denoted by the general reference character A) and which consists of a rigid bar 18, of wood, metal, or other suitable material, and a relatively thin strip 18^a, of hard rubber, gutta-percha, wood fiber, or other non-metallic, resilient, and slightly-compressible substance, which is set edgewise into a groove 20, formed longitudinally of one edge of the bar 18, whereby the strip 18^a projects a considerable distance beyond the perimeter of the bar in position to be struck by the striker devices 17, as hereinafter described. Any auxiliary means desired may be employed for securing the strip 18^a to the bar 18; but in general practice a forced insertion of the strip within the groove 20 will result in a sufficiently positive connection of the strip and bar. The bar 18 is provided with end lugs or projections 19, each of which is slidably inserted between two cleats or strips 21, each pair of which cleats or strips is secured in vertical extension to the inner side of one of the side frame members 6 and 7, as clearly shown in Fig. 1. The bar 18 is thus, together with the strip 18^a, ca-

pable of a vertical slidable movement above the hammer elements 14.

Secured to the bottom member 5 of the casing, upon the upper surface thereof, are a plurality of keepers 22, embodying each an elongated slot 23, and said keepers 22 are arranged in a series transversely of the casing-bottom 5, as clearly shown in Fig. 1. A rod 24 is passed through all of the slots 23 of the keepers 22, ranging transversely of the action beneath the keys 9, and is capable of reciprocation longitudinally of the casing, each of the keepers 22 being provided upon the walls of its respective elongated slot 23 with a felt or otherwise soft and yielding lining 25, whereby the movement of the rod 24 in its reciprocation, as hereinafter described, is effected noiselessly and without perceptible jar, the end portions of the elongated slots serving to limit the play of the rod 24. The bar 18 is provided upon its under surface with a plurality of ears 26, arranged in a series longitudinally thereof, and said ears are loosely connected with the rod 24 by means of link-arms 27, secured to the rod 24 and pivotally connected with the ears 26 at 28. There may be any suitable number of the link-arms 27; but in practice it is found that sufficient rigidity and positiveness of operation are secured by approximately an even number of the link-arms 27 and the keepers 22, as shown in the drawings.

It is manifest from the statement of construction last made that a reciprocation of the rod 24 longitudinally of the action will cause a rising and lowering of the sounding element A, consisting of the bar 18 and the strip 18ª.

Secured to the under surface of the casing-bottom 5, preferably centrally thereof and approximately in alinement transversely of the casing with the keepers 22, are a pair of cleats or strips 29, which are beveled upon their adjacent faces 30, as clearly shown in Fig. 3, and slidably mounted between said cleats 29 and upon the beveled faces 30 thereof is a block 31, the side edges of which are beveled to fit the beveled faces of the cleats 29, and due to this bevel formation and to the presence of the casing-bottom 5 the displacement of the block 31 vertically is prevented. The block 31 is provided with a head 32, which ranges upwardly therefrom and projects through an elongated slot 33, formed in the casing-bottom 5, approximately in a line longitudinally centrally thereof, as clearly shown in Figs. 1 and 3, and said head 32 is centrally recessed at 34 and provided with a cap 35, of felt or similar soft and yielding substance. The rod 24 is received within the recess 34 in the head 32, resting upon the yielding cap 35, said recessed portion 34 of the head projecting sufficiently above the upper surface of the casing-bottom 5 to insure a free action of the rod 24 in the reciprocation of the block 31 between the cleats 29, the head 32 moving within and limited by the confines of the elongated slot 33, as clearly shown in Figs. 1 and 2.

Arranged upon the under surface of the casing-bottom 5 in longitudinal alinement with the cleats 29 is a keeper 36, and an operating-rod 37 passes slidably between the same and the casing-bottom 5, having an adjustable screw connection at 38 with the block 31. The operating-rod 37 is provided at its forward end with a knob or handle 39, which normally projects slightly forwardly of the forward edge of the casing-bottom 5, as shown in Figs. 1 and 2.

It is manifest that the position of the sounding element A in its vertical adjustment relative to the hammer elements 14 and the striker devices 17 thereof may be determined by longitudinally reciprocating the operating-rod 37 by means of the knob or handle 39, such manipulation of the rod 37 causing the block 31 to reciprocate upon the cleats 29 and causing consequently the rod 24 to reciprocate laterally within the elongated slots 23 to actuate the link-arms 27 to raise or lower the sounding element A by means of their pivotal connection with the ears 26. The construction and arrangement of parts are such that when the block 31 is at the innermost or rearmost phase of its reciprocation the head 32 thereof will be in vertical alinement with the sounding element A, the rod 24 turning axially in the recessed portion 34 of the head 32 in the movement of said head, and when the head 32 is in the aforesaid vertical alinement with the sounding element A the link-arms 27 will range vertically and cause a positive support and anchorage for the sounding element A, whereby the latter will present a firm resistance to the impact of the striker devices 17, providing said sounding element A be arranged beneath the hammer elements 14, which arrangement falls within the scope of my invention, being fully shown and described in the prior application herein initially referred to. With the arrangement of the sounding element A above the hammers 14, as herein shown, the head 32 will be at the extreme forward phase of its reciprocation when the sounding element A is in its lowermost position to be struck by or receive the impact of the striker devices 17, and due to the construction and arrangement of parts and to the reception of the impact of the striker devices 17 upon the strip 18ª, which is arranged at the forward edge of the block 18, any tendency of the sounding element A to rise will be prevented.

The operation of my improved practice-clavier will be fully understood from the foregoing description and the drawings, taken in connection with the application initially herein referred to, the depression of the keys 9 at the forward ends thereof serving to elevate the hammer elements 14 and force the striker devices 17 into engagement with the strip 18ª to produce a click or toneless sound, which sound or sounds are produced approximately at that phase of the manipulation of the keys at which in a pianoforte the sound or tone re-

sulting from the contact of the hammers with the strings is produced.

It is manifest that one or more of the sounding elements A may be provided, it being found preferable to employ one beneath and one above the hammer elements 14 to be respectively engaged by the said hammer elements upon the elevation and depression thereof consequent upon the elevation and depression of the keys 9 at the forward ends thereof.

The improved sounding element A herein shown and described is found in practice to be vitally superior to sounding elements hereinbefore employed in practice-claviers, as the sound produced by the engagement of the striker devices therewith is less sharp and harsh, and due to the slightly resilient quality of the strip 18ª of the sounding element the striker devices are after contact therewith forcibly expelled into engagement with the key, or when said striker devices are mounted upon hammer elements, as herein shown and described, said hammer elements are forcibly expelled or repelled into engagement with the keys, simulating the touch of the pianoforte-action. Heretofore sounding elements for the purpose set forth have customarily embodied metallic strips or surfaces to be engaged by the striker devices, and such metallic strips or surfaces have been found lacking in the qualities last referred to and, furthermore, become indented and worn away by successive engagement therewith of the striker devices, causing inaccuracies in the play of the striker devices, thus requiring laborious adjustment of the action. I have found in experiment that when the strip 18ª consists of rubber a long-continued operation thereon by the striker devices causes no appreciable abrasion or indenture thereof, and, as above stated, the click or toneless sound produced by the engagement therewith of the striker devices is more clear and less harsh and sharp. As practice-claviers are intended to a great extent to supply an equivalent for piano-actions for practice purposes, this reduction or refinement of the sound or click produced by engagement with the sounding element of the striker devices is of manifest importance, causing a reduction of annoyance to persons within earshot of the instrument.

It is manifest that I may considerably vary the construction and arrangement of parts in adapting the same to various conditions of use without departing from the spirit of my invention and coming within the scope of the following claims.

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

1. In a practice-clavier a key, a striker device arranged to be operated thereby, a sounding element arranged adjacent said striker device and having a slidable play, a laterally-reciprocating rod having a pivotal connection with said sounding element, and a longitudinally-reciprocating operating-rod operatively connected with said first-named rod, substantially as shown and described.

2. In a practice-clavier, a casing, a key mounted thereon, a striker device arranged to be operated by said key, a sounding element having a slidable play in said casing, a rod capable of lateral reciprocation upon the bottom of said casing, and beneath said key, and in operative connection with said sounding element, and a longitudinally-reciprocating operating-rod slidably connected with the casing-bottom and in operative connection with said first-named rod, substantially as shown and described.

3. In a practice-clavier, a movable striker device, a casing in which the keys are arranged, said striker device being arranged to be operated by one of the keys, cleats secured to the casing, a sounding element slidably mounted between said cleats, a laterally-reciprocating rod mounted upon the bottom of the casing and provided with link-arms pivotally connected with said sounding element, cleats secured to the bottom of said casing, a block slidably mounted between said cleats, and operatively connected with said laterally-reciprocating rod, and a longitudinally-reciprocating rod mounted upon the bottom of said casing and in operative connection with said block.

4. In a practice-clavier a casing in which the keys are mounted, striker devices mounted in the casing and arranged to be operated by the keys, cleats secured to the opposite sides of the casing, a sounding element vertically slidably mounted between said cleats and adjacent the striker devices, keepers mounted upon the bottom of the casing and in a series transversely thereof, a laterally-reciprocating rod arranged in said keepers and provided with link-arms pivotally connected with said sounding element, a slidable block mounted beneath said casing-bottom and provided with a head ranging upwardly through an elongated slot in said casing-bottom, said laterally-reciprocating rod being loosely connected with said head, and a longitudinally-reciprocating operating-rod mounted beneath said casing-bottom and adjustably connected with said slidable block.

5. In a practice-clavier, a casing, a sounding element vertically slidably mounted between the opposite sides thereof, a rod laterally slidably mounted beneath said sounding element, and ranging in parallelism therewith, said rod being provided with link-arms pivotally connected with said sounding element, and means for moving said rod into and out of position in vertical alinement with said sounding element.

6. In a practice-clavier, a vertically-slidable sounding element, a rod or similar element ranging in parallelism therewith and laterally slidably mounted, said rod being provided with link-arms loosely connected

with said sounding element, and means for moving said rod into and out of vertical alinement with said sounding element, whereby said sounding element is vertically adjusted.

7. In a practice-clavier, an adjustable sounding element, a rod or similar element ranging in parallelism and connected therewith and laterally slidably mounted, and an operating-rod ranging at an angle therewith beneath the casing of the instrument and in operative connection with said first-named rod, said operating-rod being provided at its forward end with a knob or handle which normally projects forwardly of the casing, substantially as shown and described.

8. In a practice-clavier, a slidably-mounted sounding element, a rod or similar element laterally slidably mounted adjacent to said sounding element and operatively connected with the same, and means for moving said rod into and out of alinement with said sounding element within a predetermined plane.

In testimony whereof I have signed my name to this specification, in presence of two subscribing witnesses, this 20th day of July, 1900.

AMOS C. BERGMAN.

Witnesses:
ANTHA M. VIRGIL,
RAYMOND I. BLAKESLEE.