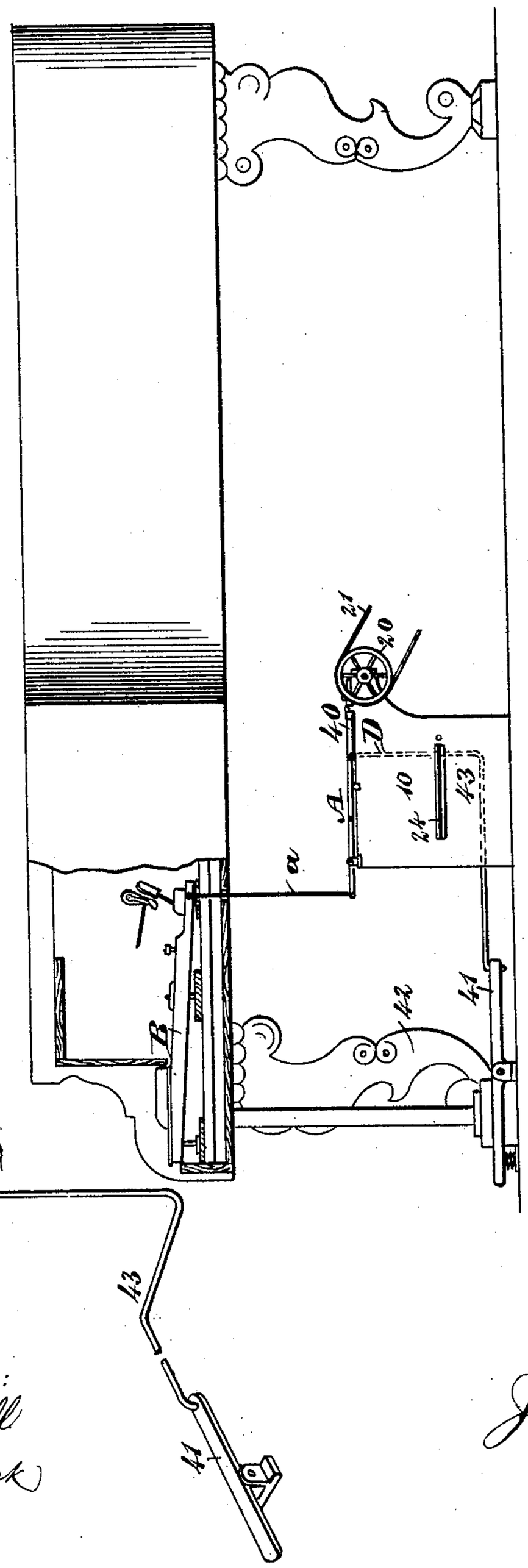
(No Model.) 6 Sheets—Sheet 1.

J. B. CALCANO i PANIZA.

RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

No. 467,854. Patented Jan. 26, 1892.

Fig. 1



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(No Model.) 6 Sheets—Sheet 2.

J. B. CALCANO i PANIZA.

RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

No. 467,854. Patented Jan. 26, 1892.

Fig. 2

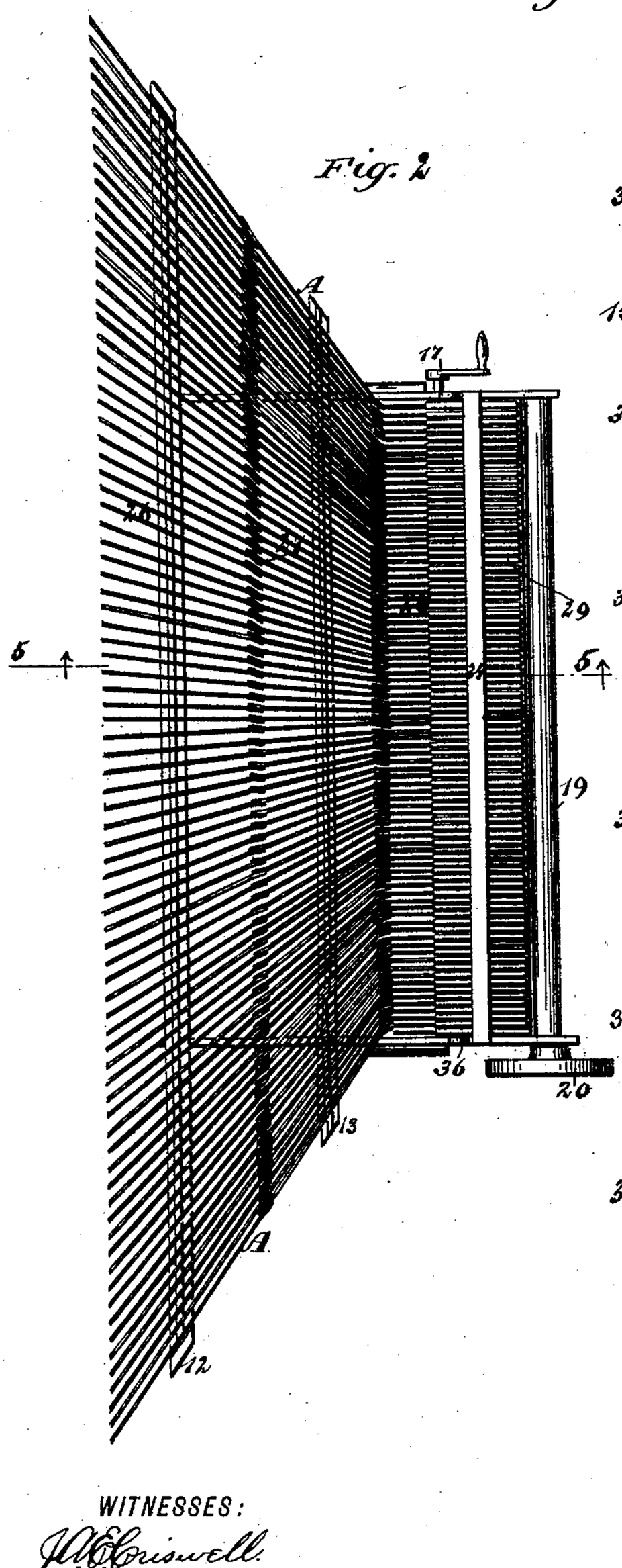
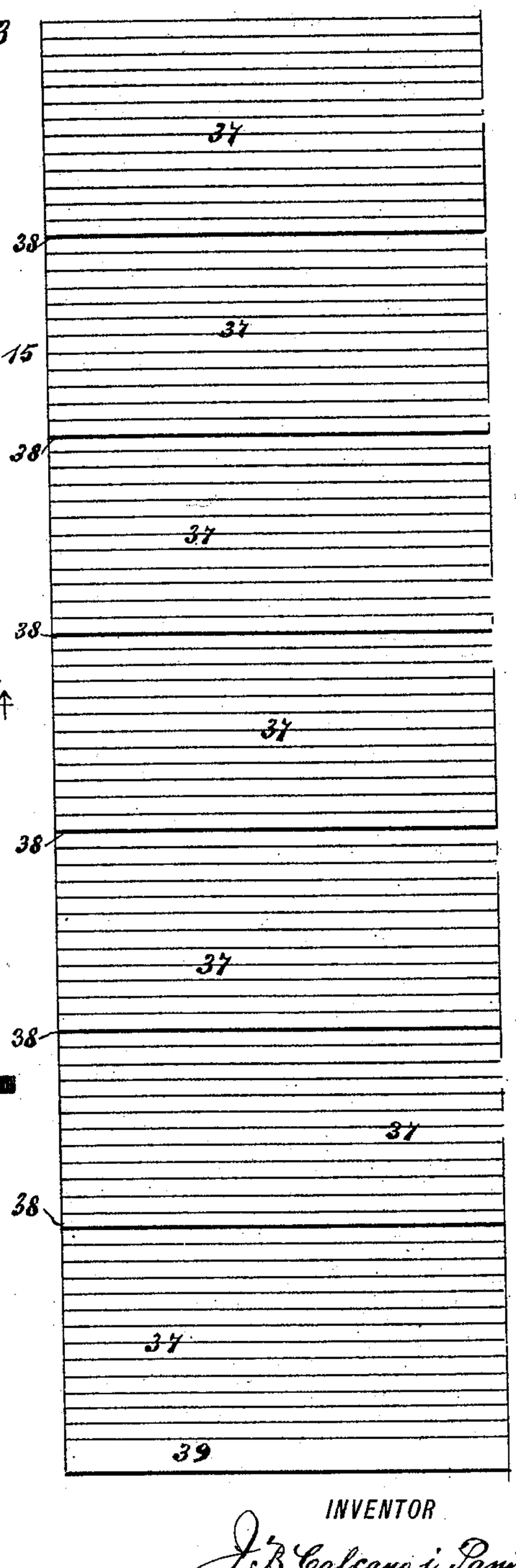


Fig. 3



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(No Model.) 6 Sheets—Sheet 3.

J. B. CALCANO i PANIZA.

RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

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Fig. 4.

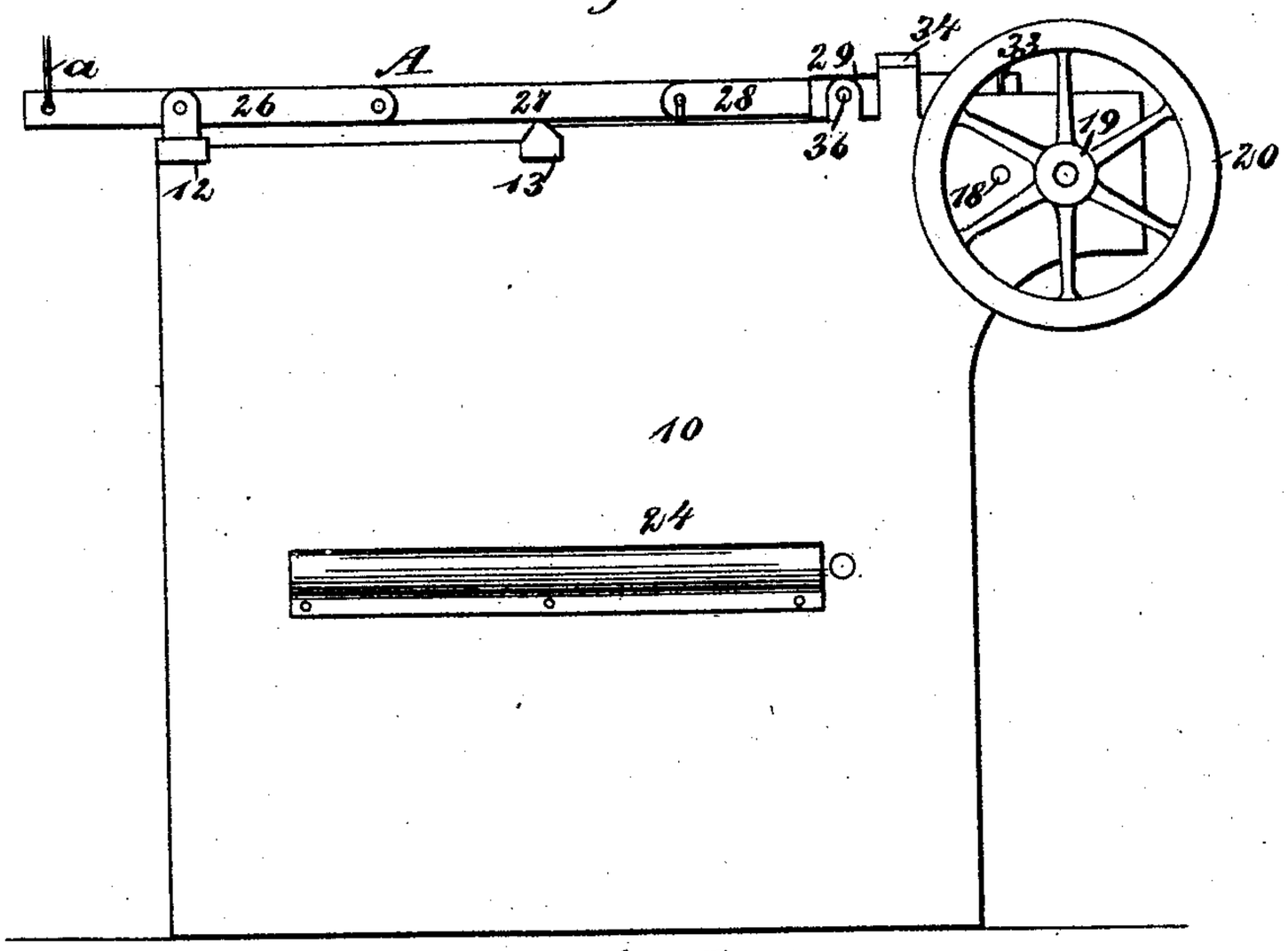
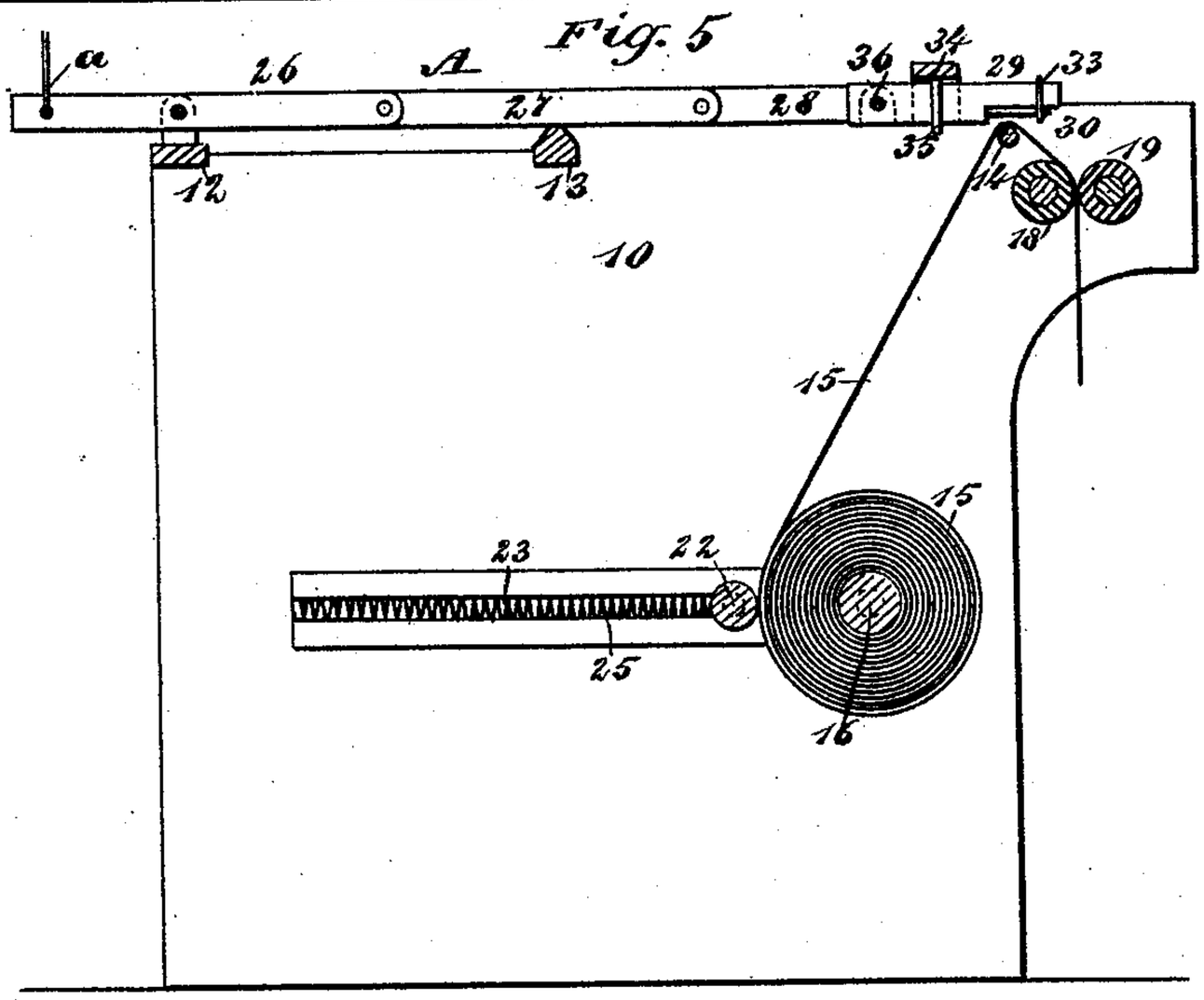


Fig. 5



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(No Model.) 6 Sheets—Sheet 4.

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RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

No. 467,854. Patented Jan. 26, 1892.

Fig. 6

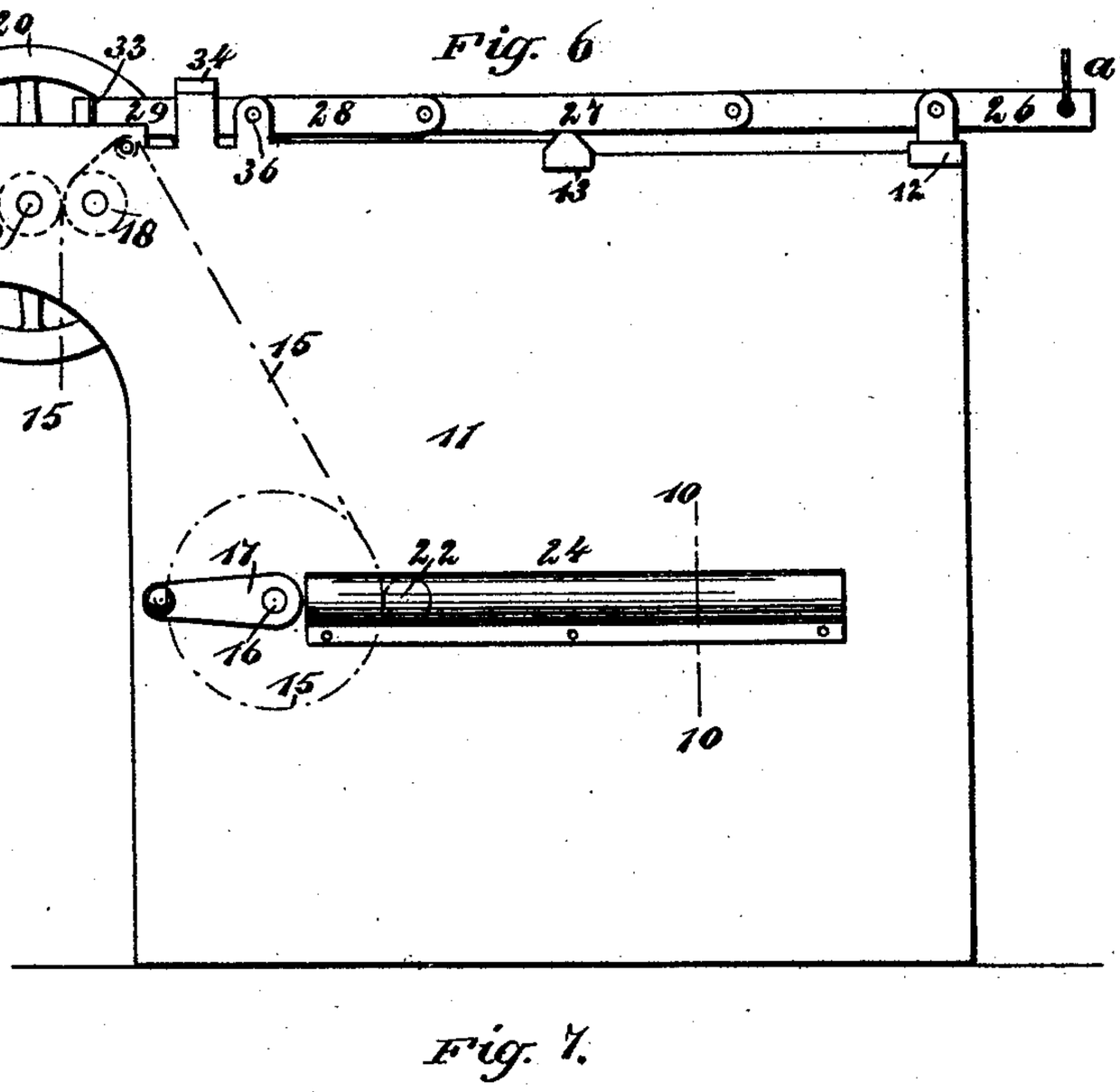


Fig. 7.

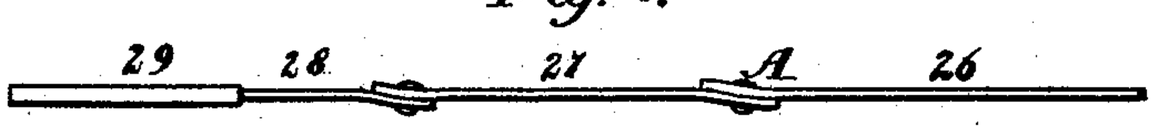


Fig. 8

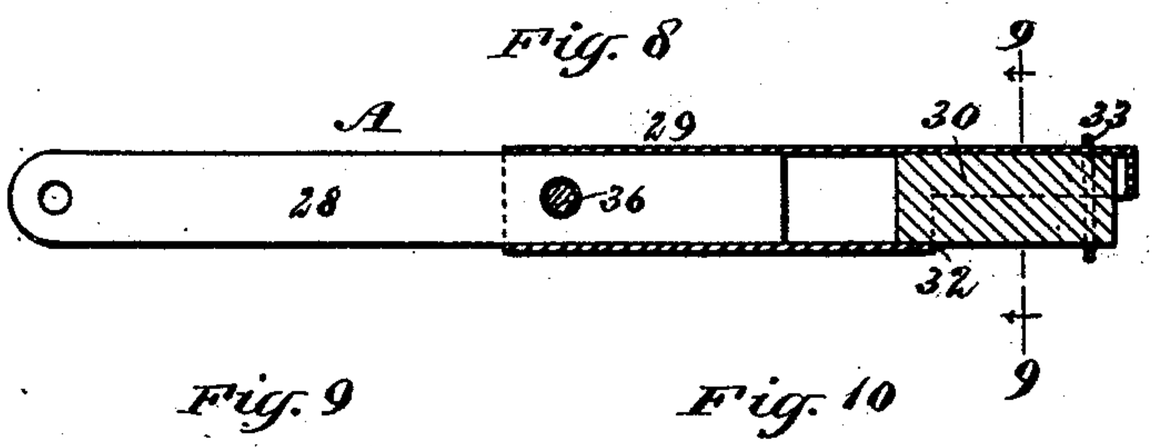


Fig. 9

Fig. 10

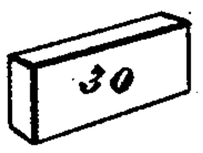
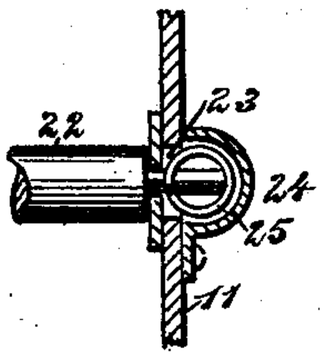


Fig. 11



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(No Model.) 6 Sheets—Sheet 5.

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RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

No. 467,854. Patented Jan. 26, 1892.

Fig 12.

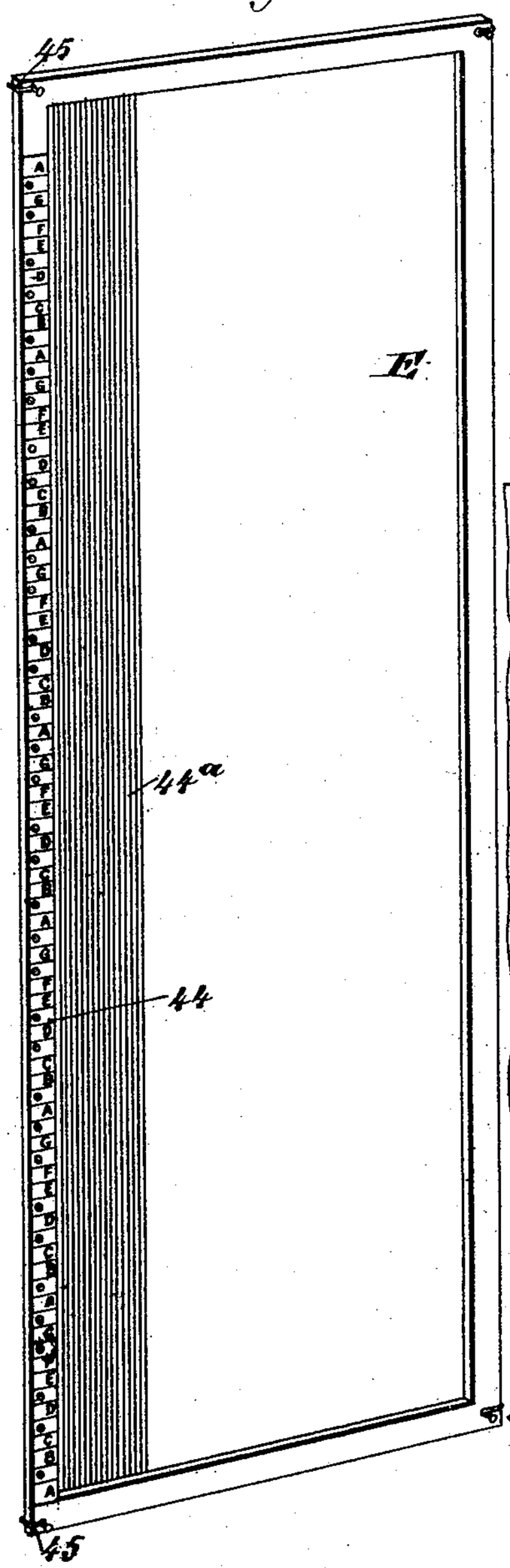


Fig 13

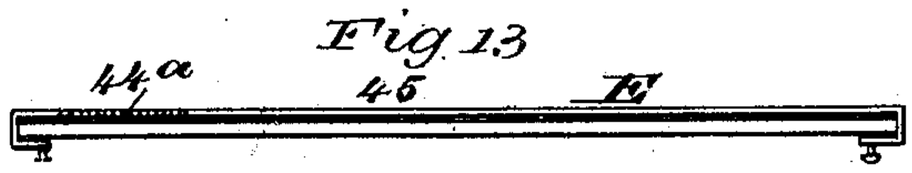


Fig 14.

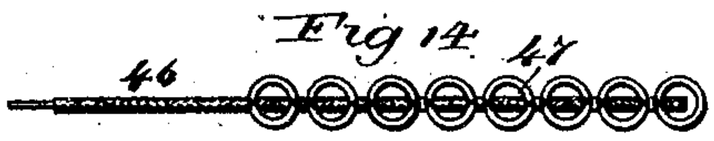


Fig 15.

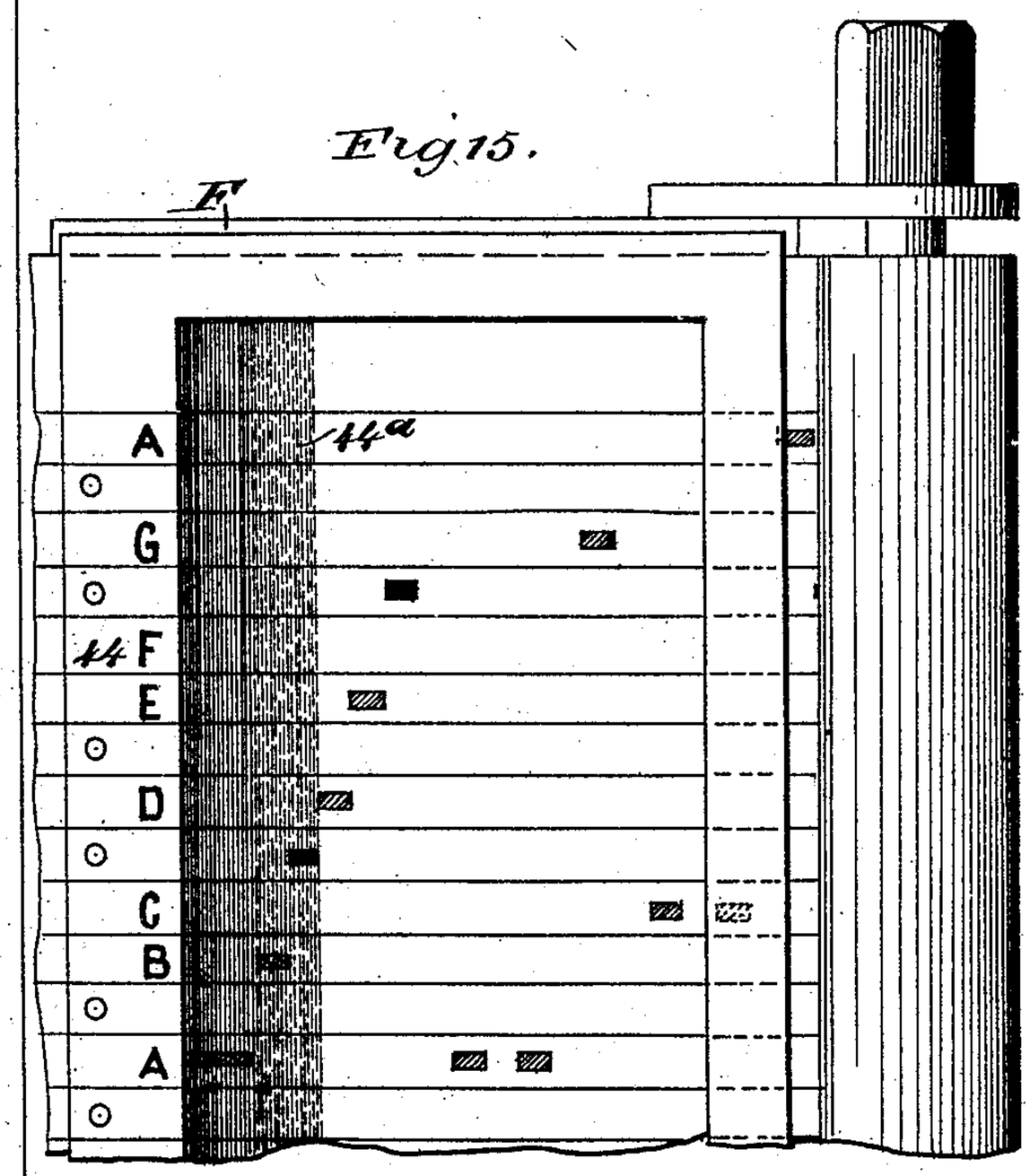
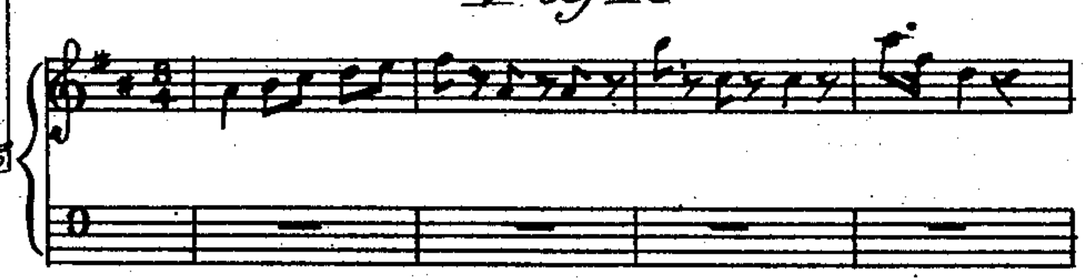


Fig 16.



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RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

No. 467,854. Patented Jan. 26, 1892.

Fig. 17

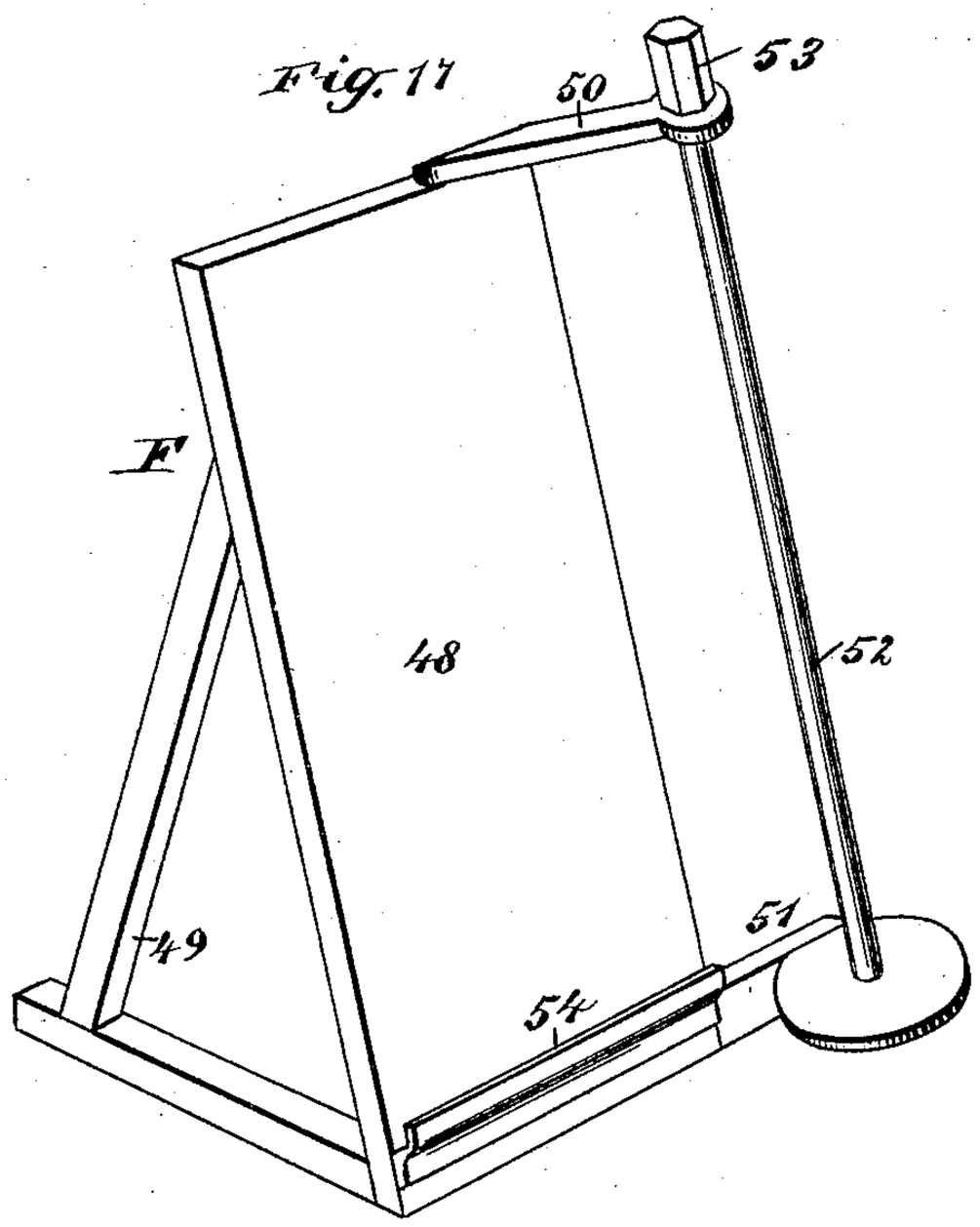
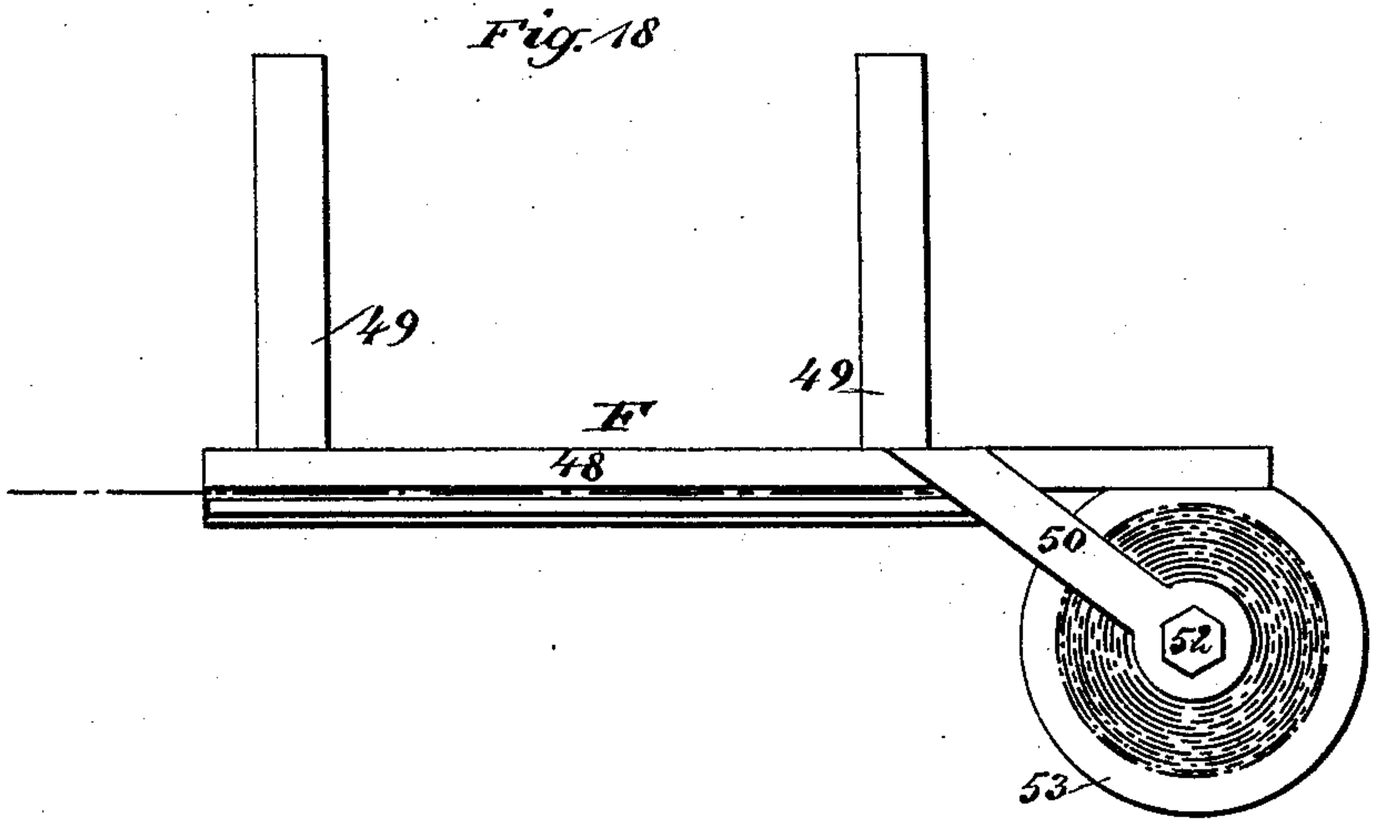


Fig. 18



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UNITED STATES PATENT OFFICE.

JUAN B. CALCAÑO I PANIZA, OF CARACAS, VENEZUELA.

RECORDING MECHANISM FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 467,854, dated January 26, 1892.

Application filed October 1, 1891. Serial No. 407,392. (No model.)

To all whom it may concern:

Be it known that I, JUAN B. CALCAÑO I PANIZA, a citizen of Colombia, and a resident of Caracas, Venezuela, South America, have invented a new and useful Recording Mechanism for Musical Instruments, of which the following is a full, clear, and exact description.

My invention relates to a recording mechanism for musical instruments, especially pianos and organs.

The object of the invention is to provide a means whereby as each key is pressed a predetermined mark indicating the note in music represented by or corresponding to the key will be produced upon a strip or tape of paper or like material and whereby, also, the length or duration of sound of the notes will be represented by graduations of said marks.

Another object of the invention is to provide a key through the medium of which the marks produced by that portion of the device connected directly with the instrument may be conveniently and expeditiously read and transcribed in the usual notes employed in reading and writing music.

The invention consists in the novel construction and combination of the several parts of the device and their combination with the keys of a musical instrument, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 represents the application of the device to a grand piano the key-board of which is in vertical section. Fig. 2 is a plan view of that portion of the device adapted for direct attachment to the instrument. Fig. 3 is a partial plan view of the paper or material upon which the notes are produced in cipher. Fig. 4 is an elevation of one side of the recording mechanism, of which Fig. 2 is the plan. Fig. 5 is a vertical longitudinal section through the recording mechanism, taken practically upon the line 5 5 of Fig. 2; and Fig. 6 is an elevation of the side of the recording mechanism opposite that shown in Fig. 4. Fig. 7 is a plan view of one of the key-levers of the recording mechanism. Fig. 8 is a longitudinal section through the rear end of said lever. Fig. 9 is a transverse section through the lever, taken practically on the line 9 9 of Fig. 8; and Fig. 10 is a perspective view of one of the marking-blocks carried by the levers. Fig. 11 is a detail sectional view taken on the line 10 10 of Fig. 6. Fig. 12 is a perspective view of the transcribing or transposing frame. Fig. 13 is a plan view of said frame, and Fig. 14 is a detail view illustrating a means for adjusting the cords of the transcribing-frame. Fig. 15 is a view illustrating the transposing-frame used in conjunction with the cipher-paper, the latter being upon an easel; and Fig. 16 represents a few bars of music read from the paper. Fig. 17 is a perspective view of an easel used in connection with the transposing-frame and paper, and Fig. 18 is a plan view of the easel. Fig. 19 is a perspective view of the time-lever and its pedal.

The recording mechanism is made as compact as possible, in order that it may be placed beneath the instrument, as shown in Fig. 1, and occupy but little space, it being preferred that said mechanism should sit upon a support beneath the instrument. The frame of the recording mechanism consists, practically, of two side pieces 10 and 11, and these two pieces are set parallel. The side pieces are connected by rods, braces, or in any approved manner, two of the connections comprising a front upper bar 12, an intermediate bar 13, somewhat triangular in cross-section, as shown in Fig. 5, and a further connection (illustrated in the same figure) consists in a rod 14, located near the upper portion and near the back. The rod 14 constitutes a guide for the tape 15 upon which ciphers are to be produced, said tape being wound upon a roller 16, journaled transversely in the central rear portion of the frame and turned to wind the tape thereon by a crank 17 at one end, as shown in Fig. 6, or by any equivalent of a crank. The tape after being carried upward over the guide-rod 14 is passed downward between two feed-rollers 18 and 19, (best shown in Fig. 5,) said rollers being journaled in the sides of the frame near its upper rear portion, an extension being usually provided for the purpose. The driving-pulley 20 of the mechanism is secured to one trunnion or one end of the shaft of one of the rollers, and the

propelling mechanism connects by a belt 21 (shown in Fig. 1) with the driving-pulley.

The propelling mechanism may consist of any suitable motor. Electricity is, however, preferred, as push-buttons are ordinarily used to turn the current on and off for starting and stopping the motor, said buttons being convenient of location upon the instruments and also for manipulation. Tension is at all times exerted upon the roll of tape when upon its roller through the medium of a tension-roll 22, its trunnions being passed through horizontal slots 23 in the side pieces of the frame, as shown in Figs. 5 and 11, into housings 24, secured to the outer faces of the side pieces and exteriorly concealing the slots. Springs 25 are contained within the housings, and they exert a constant pressure upon the trunnions of the tension-roll, compelling it to constantly and firmly engage with the periphery of the tape-roll, as clearly shown in Fig. 5.

A marking-lever A is employed in connection with every key B of the instrument, whether sharp, flat, or natural, black or white, and in order to economize in space these levers are made to converge at their rear ends, as shown in Fig. 2. The levers are located horizontally upon and longitudinally of the upper or top portion of the frame. The levers are of like construction and are made up of a number of sections comprising, preferably, three pivotally-connected links 26, 27, and 28 and a marking-tip 29, carried by the rear link. The forward link 26 of each key-lever is fulcrumed somewhere near its center upon a projection of the front bar 12 of the frame, and each intermediate link 27 rests upon the intermediate triangular bar 13 of the frame, as shown in Figs. 2, 4, 5, and 6, the pivotal connection of the lever-links being shown in detail in Fig. 7. The forward end of each forward lever-link is united with the rear extremity of a key B of the key-board of the instrument by a connecting-wire *a*, as is illustrated in Fig. 1. Thus when a key is pressed the front end of the forward link of the lever connected with that particular key is raised and its inner or rear end lowered. A reverse movement is communicated to the intermediate link; but the same movement is transmitted to the rear link—that is, its rear end is depressed and the marking-tip is carried downward in a manner forcing the block or crayon 30 of pigment attached to the tip in engagement with the tape, and the tip will continue to mark upon the tape during the entire time the key is under pressure. It is evident that, as the tape is at this time in constant motion, the length of a mark upon the tape will indicate the value of the note of music played and to be afterward translated. All the music will be indicated in the treble-clef, but the translator will write in both the treble and base clefs the corresponding notes.

I employ pigment of different colors—one color for the black and one for the white keys—to facilitate reading the marks or ciphers. The blocks of pigment I prefer to make rectangular, as shown in Fig. 10; but they may be given other shapes. The marking-tip 29 at the under side of its forward end has a recess 32 produced therein to expose the pigment block or crayon when introduced into the tip, as particularly shown in Fig. 8. It will be observed that the marking-tips are firmly attached to the key-levers and that the block of pigment is supported at its rear end by a link 33; but other fastening devices may be substituted, this particular construction having been adopted owing to the ease with which the pigments may be adjusted.

As the key-levers are somewhat lengthy, they are liable to have lateral play as well as lateral movement. A lateral movement is very objectionable, as the markers would not then at all times mark the tape in the same manner. I prevent the possibility of lateral movement by extending across the marking-tips of all the key-levers a keeper or guide-bar 34, as shown in Figs. 2 and 5, provided with a series of downwardly-extending pins 35, one of which enters the space between each contiguous marking-tip. By reference to Figs. 4 and 5 it will be noticed that a rod 36, which extends from side to side of the frame and through all the rear links of the key-levers and marking-tips, serves as a fulcrum for the links and also as a connecting medium between the links and tips.

In Fig. 3 I have illustrated a transvese section of the tape. It is ruled with a series of longitudinal parallel lines 37, arranged somewhat close together, and a series of spaced heavy longitudinal lines 38. Each of the heavy lines 38 is of a different color, as they divide the tape into panels, each panel representing an octave, and the number of spaces between the lines in each panel corresponds to the number of keys, black and white, comprising an octave in the key-board of the instrument.

At one side edge of the tape a marginal space 39 is provided, in which the time is to be indicated, and the spaces under the heavy lines 38 nearest this margin represent the highest octave, and the color of the line in practice is preferably yellow.

The time-lever D is shown in detail in Fig. 19 and in position in Fig. 1, said lever being fulcrumed at one side of the row of key-levers, and in construction consists of two members—namely, a single link 40 and a marking-tip 29, as heretofore described—secured to the link. The tip is located in alignment with the tips of the key-levers and engages with the tape in like manner. The time-lever is not operated from a key, but by means of the right foot acting upon the lever 41, preferably located alongside and to the right of the treadle-harp 42 of a piano, as illustrated in Fig. 1, and is united to the lever through the medium of a suitable connecting-rod 43.

After composing or extemporizing by the

manipulation of the keys of the instrument the marks or ciphers upon the tape must be read off and written in the usual musical characters, as shown in Fig. 16, and the time and signature added to the score. For accomplishing this end a transcribing or transposing frame E is employed in connection with an easel F. The body portion of the transcribing or transposing frame is rectangular and in skeleton form, as shown in Fig. 12, and upon one upright member of the frame a scale 44 is produced, the spaces whereof correspond in width to the spaces intervening the lines 37 of the tape and in number to the keys of the instrument. In each space of the scale the name of the note represented by the key occupying a like position on the key-board is produced, the names of the white or natural keys being in letter or syllable—as, for instance, "A" or "La"—and the black keys are indicated by arbitrarily-selected characters and may be read either a flat or a sharp at the pleasure of the composer or according to the signature already indicated. Sixteen cords 44^a, preferably of silk, are arranged at equidistances apart, extending from top to bottom of the frame and at a right angle to the scale representing the key-board. The sixteen cords and the inside edge of the left side of the frame produce sixteen spaces, and each space represents one-sixteenth of a beat. Thus if a mark on the tape should cross all of the spaces between the cords it would be given the entire time of a beat. In three-four time, for example, it would be written a quarter-note. If the mark, however, crossed but half the spaces, it would be given half the time of a beat and written in three-four time a one-eighth note, and if the mark crossed but one space it would be read a sixteenth, or it is to be played in the time of one-sixteenth of a beat. The cords are preferably strung upon transverse cords or wires 45, located on the back of the frame at the top and bottom, and the longitudinal cords are preferably made movable upon the transverse cords, or the transverse cords may be of elastic, as shown at 46 in Fig. 14, and provided with a series of rings 47. In this event one end of the elastic cord is not permanently attached to the frame and a stud is secured to the frame at one side, over which any one of the rings may be placed. This will enable the operator to carry the reading-cords 44^a to the center or opposite side of the frame.

The easel is illustrated in Figs. 17 and 18 and may be of any desired pattern. Preferably the body 48 is held and supported in an inclined position by a rear base and brace section 49. An upper and a lower arm are projected from one side of the body 48, the upper arm 50 being at an angle to the body and the lower arm 51 parallel therewith. In the upper arm one end of a reel 52 is held to turn, said end being provided with a polygonal extremity 53 to facilitate the turning of the reel, and the lower end of the reel turns in a support formed on or secured to the lower arm of the easel. The outer face of the easel at its lower end is provided with a shelf or ledge 54.

In the operation of the device the motor attached to the recording mechanism is set in motion, and the operator while pressing the keys in the act of playing makes long or short marks upon the tape, according as the keys are held down a long or a short time. The marked paper coils upon the floor, or a receptacle may be placed to receive it. The first time-beat of the first bar may also be recorded by pressing the pedal and holding it in that position the duration of said beat. If the regular time be interrupted, whenever it is resumed the time-pedal is operated to again indicate time. After the performer has ceased playing the printed portion of the tape is cut off and rolled upon the reel of the easel in such a manner that the tape will unroll with the time-margin uppermost. The first portion of the tape to be read is unwound and carried over the easel and the transcribing-frame is laid upon it, as shown in Fig. 15, which figure is read as shown in Fig. 16. The first note struck was A, and the value of the note is the duration of one beat, as the mark covers the entire sixteen spaces of the transcribing-frame. When, as shown in dotted lines, the next reading is had, it is found that two notes were struck in the time of one beat—namely, B and C sharp, (since the composer elected to make it C-sharp instead of D-flat in transcribing)—and the next reading develops two more notes struck in the time of one beat, which are D and E. Three-four time is elected by the artist. Therefore, the first note is written a quarter-note and each couplet after eighth-notes, completing a bar. In this manner the further reading of the tape is conducted.

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

1. In a musical instrument, the combination, with the keys, of a recording-mechanism consisting of a series of levers having link connection with the keys and provided with marking blocks or crayons, a spacing or guide bar extending over the levers and provided with downwardly-extending fingers located between the levers, a tape held to revolve beneath the marking blocks or crayons and contiguous thereto, and tension devices applied to the tape, as and for the purpose set forth.

2. The combination, with the keys of a musical instrument, a recording device operated by the keys, a foot-lever operating a time-lever on the recording device, and a tape adapted to receive symbols representing notes impressed thereon by the levers and located adjacent to the levers, of a transposing or transcribing frame provided with a series of strands and a scale representing the key-

board of the instrument, and an easel adapted to receive the tape and the frame, substantially as shown and described.

3. The combination, with a musical instrument, its keys, and a recording mechanism provided with a series of marking-levers operated by the keys, a time-lever operated independently of the keys, and a tape acted upon by the levers and adapted to receive symbols representing notes of music, of an easel provided with a reel adapted to receive the tape, and a transposing or transcribing frame provided with a series of strands or spacing devices and a scale adjacent to the spacing devices and representing the key-board of the instrument, as and for the purpose specified.

4. In a musical instrument, a recording mechanism consisting of a series of levers fulcrumed upon a frame, one end of the levers being adapted for attachments to the instruments, the opposite ends being formed as sockets, marking blocks or crayons held in the sockets of the levers, and a tape held to revolve beneath the marking blocks or crayons, said tape being provided with a series of lines arranged in groups representing octaves, the defining-line of each group being of a different color, substantially as shown and described.

5. In a musical instrument, the combination, with the keys, of a recording mechanism consisting of a series of levers having connection with the keys and having one end provided with a socket, marking blocks or crayons adjustably located in the sockets of the levers, a guide-bar extending over the levers, a tape held to revolve beneath the marking blocks or crayons, provided with lines arranged in groups representing octaves, tension devices applied to the tape, and a propelling mechanism for the tape, substantially as shown and described.

6. In a musical instrument, the combination, with the keys, of a recording mechanism consisting of a series of levers connected with the keys and comprising a series of pivotally-connected sections, marking blocks or crayons adjustably carried by the levers, a spacing or guide bar extending over the levers and provided with downwardly-extending fingers located between the levers, a tape held to revolve beneath the marking blocks or crayons, tension devices applied to the tape, and a propelling mechanism for the tape, substantially as described.

7. The combination, with the keys of a musical instrument, a recording device operated by the keys, a lever adapted to indicate time carried by the recording mechanism, and a tape adapted to receive symbols representing notes impressed thereon by the levers and provided with a series of lines grouped to represent octaves, of a transposing or transcribing frame provided with a series of strands and a scale representing the key-board of the instrument, and an easel adapted to receive the frame and provided with a reel to receive the tape, substantially as shown and described.

8. In a musical instrument, the combination, with a recording mechanism operated by the keys of the instrument and a tape having symbols representing notes impressed thereon by the recording mechanism, of a transposing or transcribing device operated in conjunction with the tape, and a support provided with a reeling mechanism receiving the transcribing device and tape, substantially as described.

9. In a music-recording attachment for pianos and other musical instruments, a transposing or transcribing frame provided with a series of strands arranged substantially as described and provided with a scale representing the key-board of the instrument in connection with which it is used, as and for the purpose specified.

10. In a music-recording attachment for pianos and other musical instruments, the combination, with a tape having symbols representing notes of music produced thereon, of a transposing or transcribing frame provided with a series of strands and a scale representing the key-board of an instrument, whereby the symbols upon the tape may be read, substantially as described.

11. In a music-recording attachment for pianos and other musical instruments, the combination, with a tape having symbols representing notes of music produced thereon, of a transposing or transcribing device provided with a series of strands and a scale representing the key-board of an instrument, and an easel adapted to receive the transcribing device and provided with a reeling mechanism to receive the tape, substantially as described.

12. In a music-recording attachment for pianos and other musical instruments, an easel and a reeling mechanism carried by the easel, substantially as and for the purpose specified.

13. A tape adapted to receive symbols representing notes of music, said tape being provided with a series of lines arrranged in groups, each group being clearly defined and representing an octave, substantially as shown and described.

14. A tape adapted to receive symbols representing notes of music, said tape being provided with a series of lines arranged in groups representing octaves, the terminal line of each group being of different color, the said tape being also provided with a marginal space to receive a record of time, as and for the purpose specified.

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