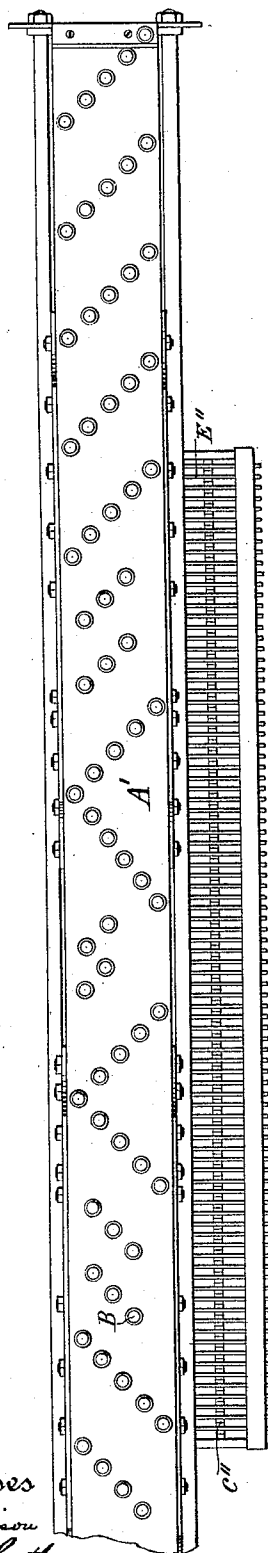


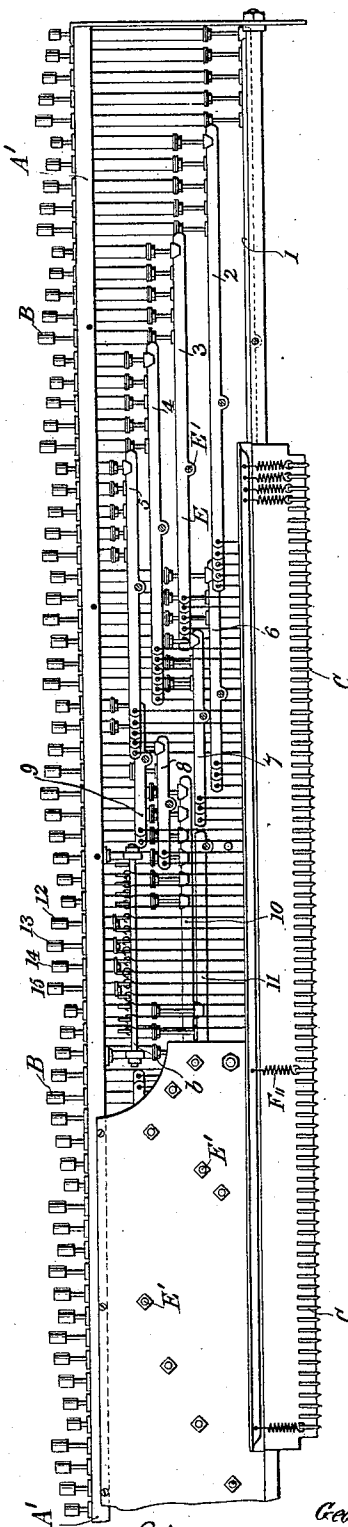
G. PILAR DE PILCHAU,
MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.
No. 507,840.
Patented Oct. 31, 1893.

Fig. 1



Witnesses
Emuel Hopkinson
James N. Galloway

Fig. 2



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By his Attorneys
Dureau & Page

(No Model.)

7 Sheets—Sheet 2.

G. PILAR DE PILCHAU.

MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.

No. 507,840.

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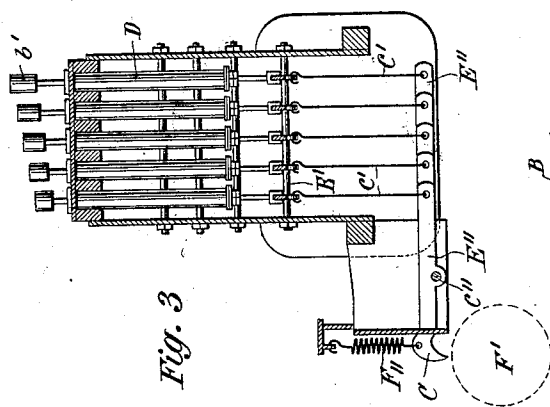


Fig. 3

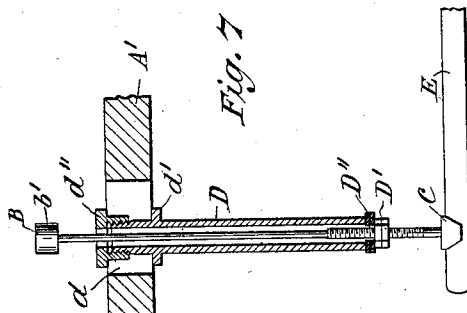


Fig. 7

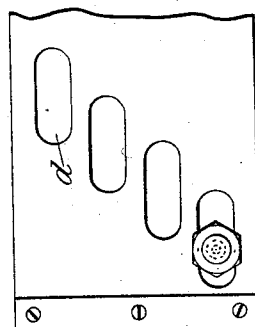


Fig. 6

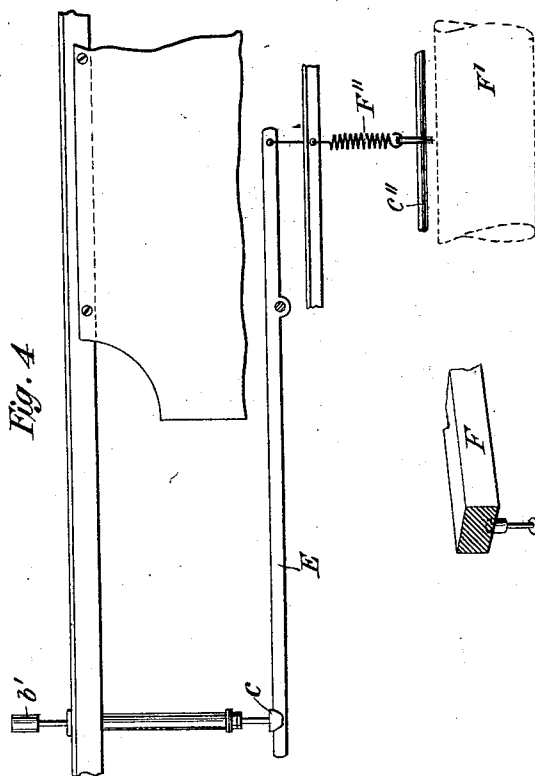


Fig. 4

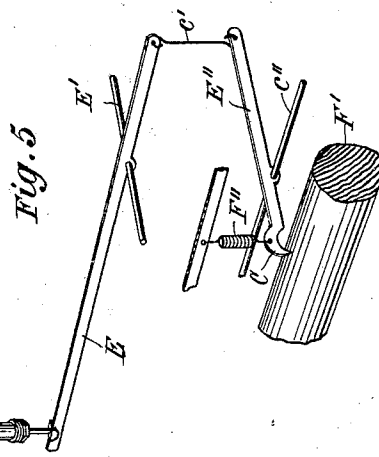


Fig. 5

Witnesses
Ernest Hutchinson
James W. Galloway

Inventor
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(No Model.)

7 Sheets—Sheet 3.

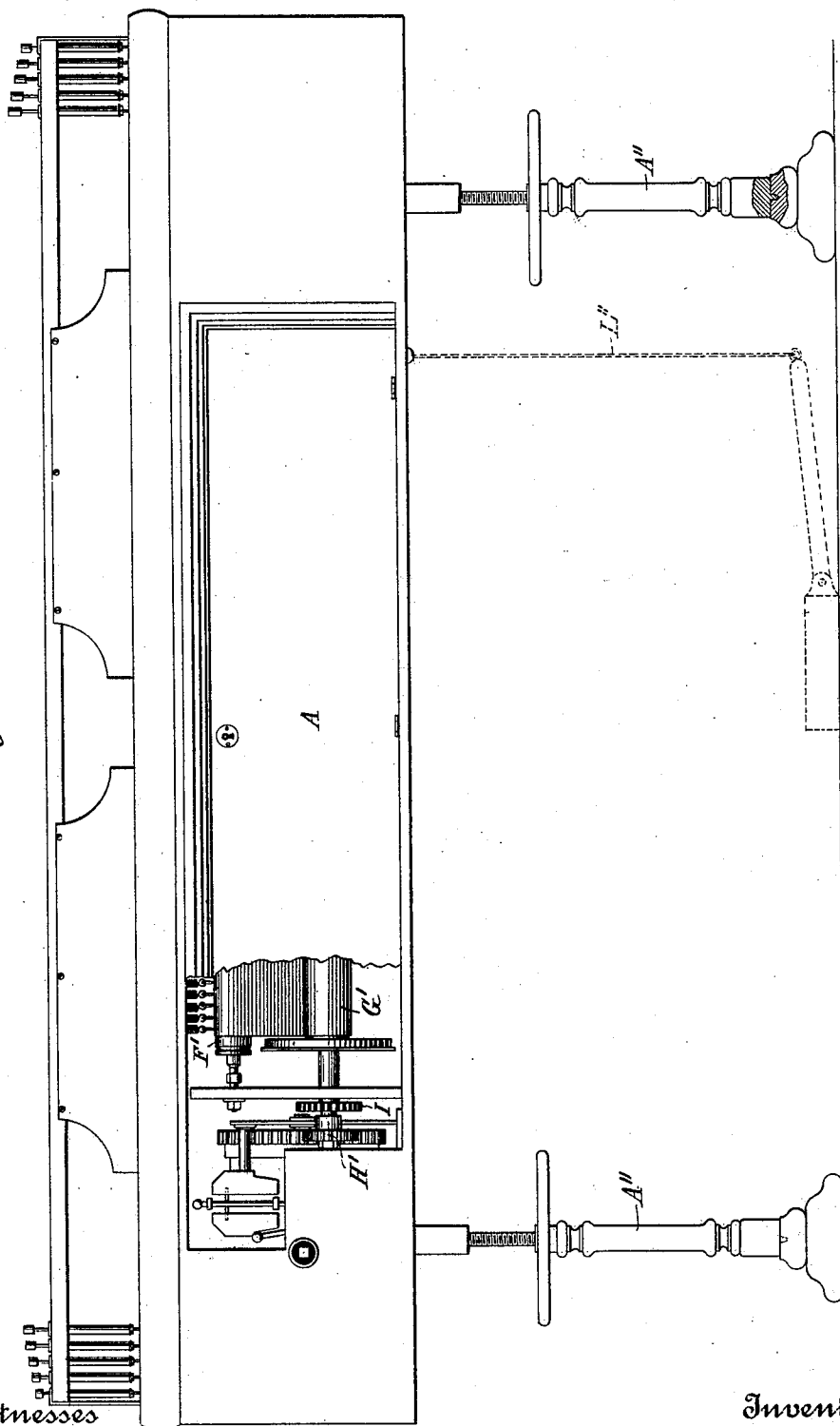
G. PILAR DE PILCHAU.

MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.

No. 507,840.

Patented Oct. 31, 1893.

Fig. 8



Witnesses
Ernest Hopkinson
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(No Model.)

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G. PILAR DE PILCHAU.

MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.

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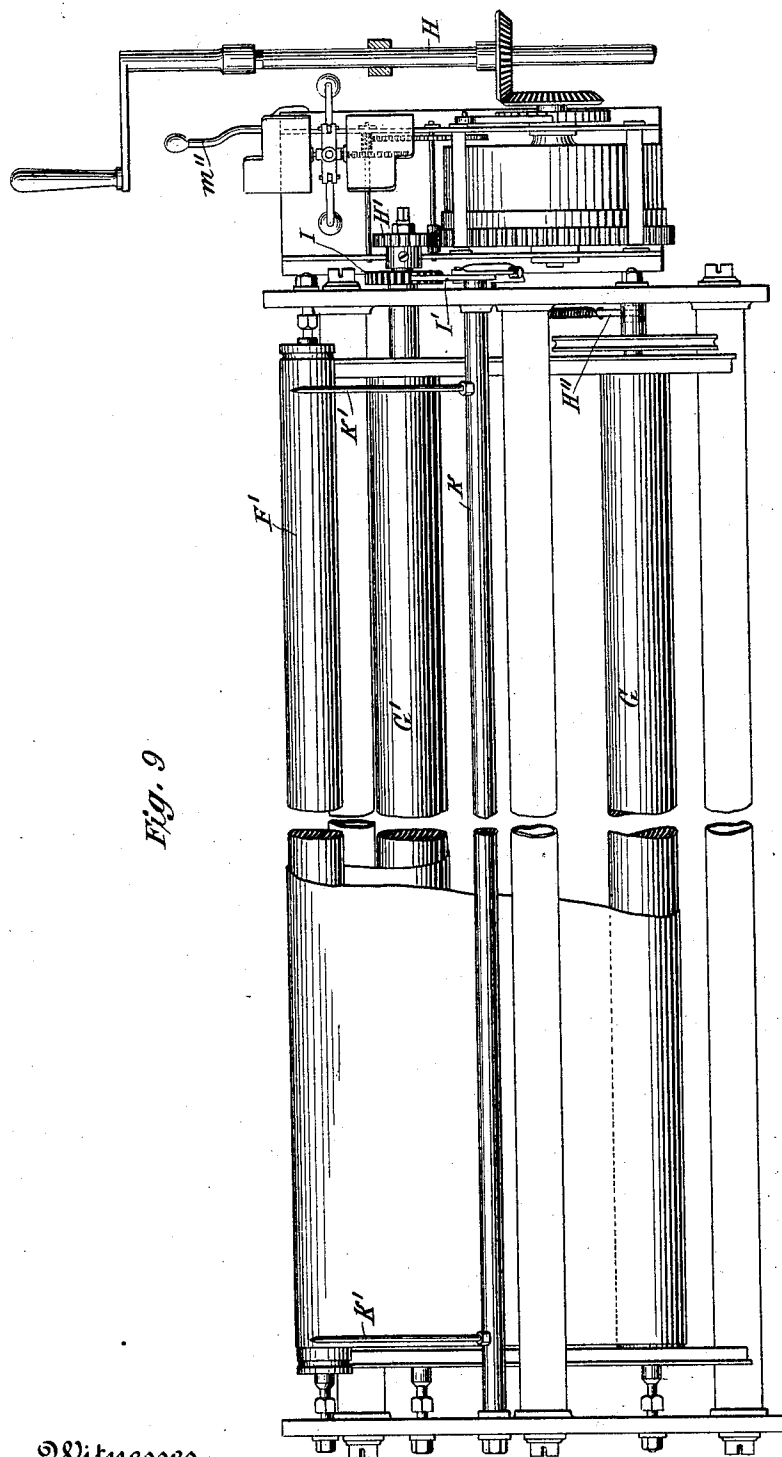


Fig. 9

Witnesses
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(No Model.)

7 Sheets—Sheet 5.

G. PILAR DE PILCHAU.

MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.

No. 507,840.

Patented Oct. 31, 1893.

Fig. 12

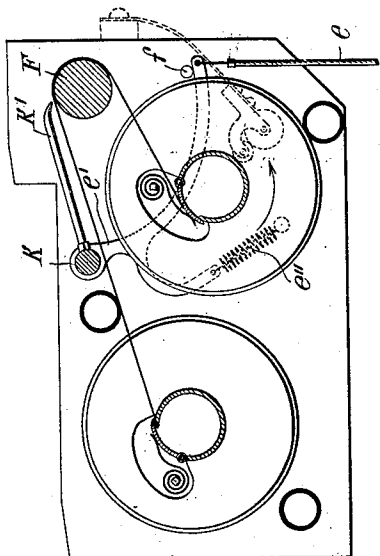


Fig. 13

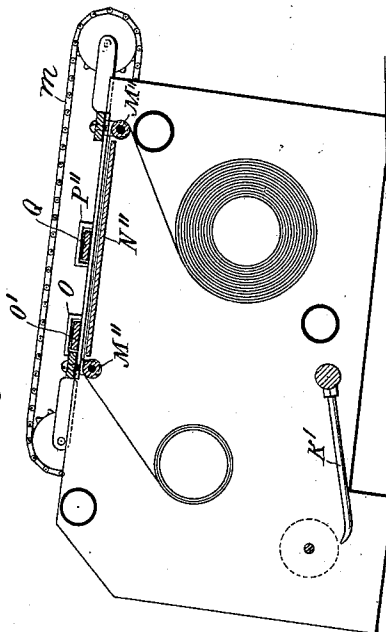


Fig. 10

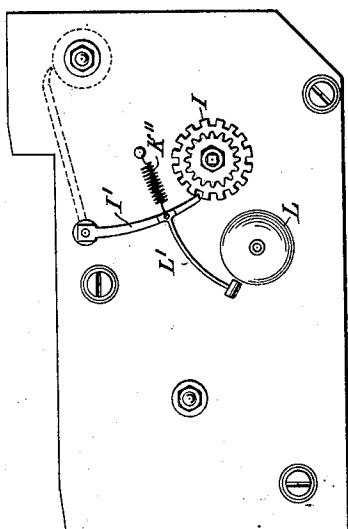
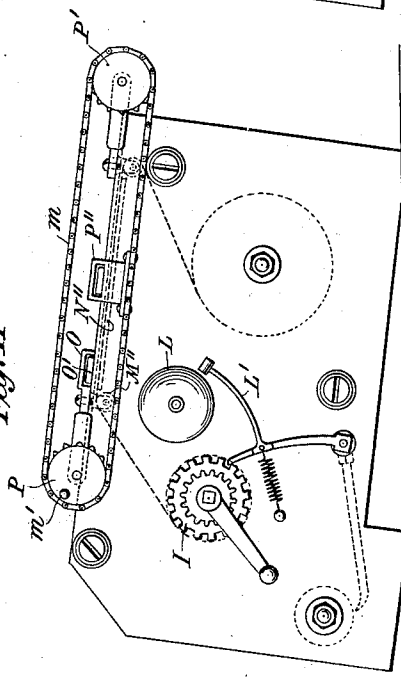


Fig. 11



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(No Model.)

7 Sheets—Sheet 6.

G. PILAR DE PILCHAU.

MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.

No. 507,840.

Patented Oct. 31, 1893.

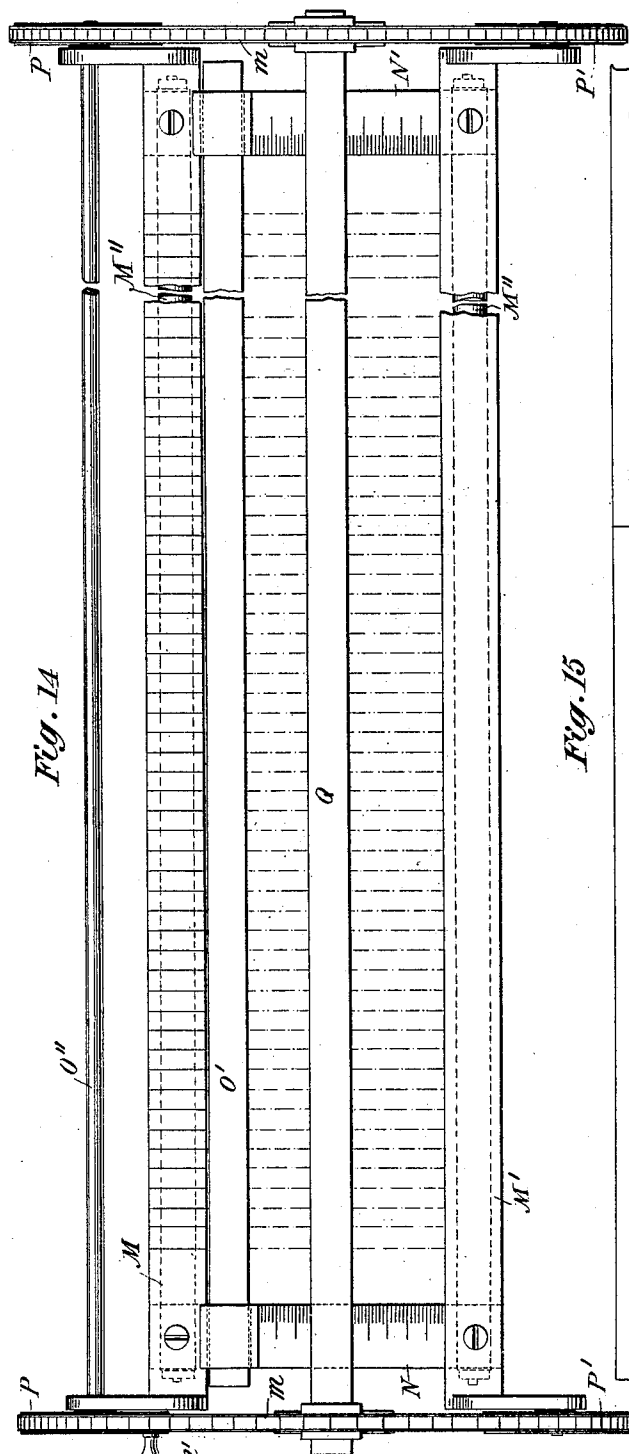


Fig. 14

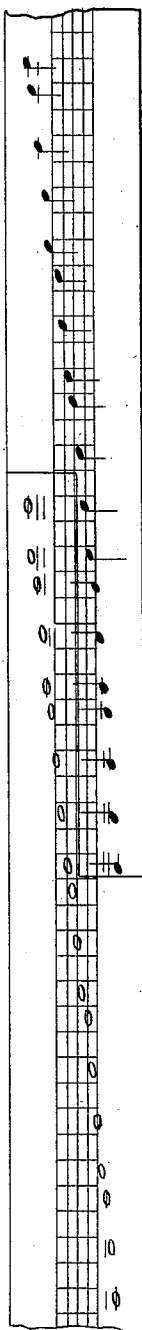


Fig. 15



Fig. 16



Fig. 17

Witnesses
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James H. Ballou.

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Georges Pilar de Pilchau.
By His Attorneys
Bunce & Page

(No Model.)

7 Sheets—Sheet 7.

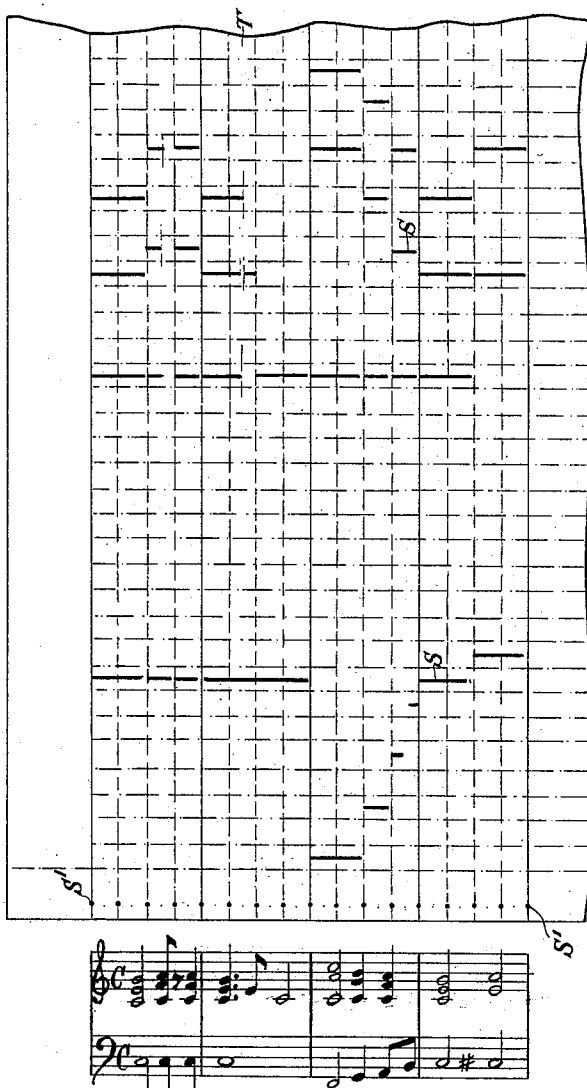
G. PILAR DE PILCHAU.

MELOGRAPH OR MUSIC RECORDING ATTACHMENT FOR PIANOS.

No. 507,840.

Patented Oct. 31, 1893.

Fig. 13



Witnesses
Ernest Hopkinson
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UNITED STATES PATENT OFFICE.

GEORGES PILAR DE PILCHAU, OF ST. PETERSBURG, RUSSIA.

MELOGRAPH OR MUSIC-RECORDING ATTACHMENT FOR PIANOS.

SPECIFICATION forming part of Letters Patent No. 507,840, dated October 31, 1893.

Application filed June 10, 1893. Serial No. 477,215. (No model.)

To all whom it may concern:

Be it known that I, GEORGES PILAR DE PILCHAU, a subject of the Czar of Russia, and a resident of St. Petersburg, in the Empire of Russia, have invented a new and useful Improvement in Melographs or Music-Recording Attachments for Pianos, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The subject of my present application is an improvement in mechanical appliances for marking on a suitable surface the value and duration of the notes of a musical composition while the same is being performed on a piano, and thus to produce a permanent record which may at any time be translated and transcribed into the ordinary musical notation.

The object of the invention is to provide a device which may be attached to any piano and which will indicate upon a traveling band or sheet of paper or like material certain defined marks or impressions which by their relative positions will indicate all the keys that have been depressed in playing and the order of depression, and by their special character the duration of each impression, and also to provide an instrument or device by means of which the value, position and duration of each note in the musical scale corresponding to the marks or impressions on the band may be at once ascertained. My improved apparatus for this purpose is purely mechanical in its construction. The recording mechanism consists, essentially, of a series of marking levers, one for each piano key, and in positions to be engaged by said keys when depressed, and a sheet of paper movable at a determined rate which receives the impression made by said levers. This portion of the apparatus also involves devices for indicating the measure or tempo, and other devices hereinafter to be described. The translating mechanism comprises a system of scales to which all parts of the marked or impressed sheet are successively applied, and which indicate directly the position and duration of each note corresponding to the marks, the measure or time of the piece and the intervals or rests.

I shall proceed now to describe my im-

proved apparatus by reference to the accompanying drawings.

Figure 1 is a plan view of the recording mechanism for attachment to the piano. Fig. 2 is a rear view in elevation of the same. Fig. 3 is a vertical cross-section of the recording mechanism. Fig. 4 is a development on an enlarged scale of one of the marking levers. Fig. 5 is a similar view but in perspective. Fig. 6 is a plan view of a detail in the mechanism of the recording instrument. Fig. 7 is a vertical section of a plunger by means of which the movement of a key is transmitted to its corresponding marking lever. Fig. 8 is a front elevation of the instrument as applied to a piano, a portion of the front casing being removed. Fig. 9 is a view in elevation and on an enlarged scale of the mechanism for supporting, moving and marking the paper. Fig. 10 is an end view of Fig. 9 with the driving mechanism detached. Fig. 11 is also an end view of the same mechanism inverted and with the deciphering or translating mechanism attached. Fig. 12 is a cross-section of Fig. 9 taken at any point between the end plates of the instrument and the rolls. Fig. 13 is a cross-section of the instrument of Fig. 9, in its inverted position and taken at any point through the rolls. Fig. 14 is a plan view of the system of translating or deciphering scales. Fig. 15 is a plan view enlarged, of a rule or scale used in the apparatus. Figs. 16 and 17 are modified forms of the same. Fig. 18 is a diagram representing a portion of a sheet with the marks thereon, and the ordinary method of representing the notes to which such marks correspond.

Similar letters and numerals of reference indicate corresponding parts in the several figures and sheets of the drawings.

The apparatus is contained in a box or case A of suitable character, which is adapted to be attached to a piano as by means of the vertically adjustable standards or supports A" Fig. 8.

B B indicate a series of plungers or rods which are designed to be depressed by the piano keys and to impart this movement to the recording mechanism. As there is a separate plunger for each key there will generally be employed eighty-five plungers to adapt the instrument to a seven octave piano. The

length of the plate A' through which these plungers work will be, of course, at least equal to that of the key-board, but it is essential to the practicability of the device that the marks
 5 or impressions made on a sheet of paper by the plungers and the accessories should be confined to a very much narrower space, and for this purpose a special arrangement of levers is employed with the plungers and mark-
 10 ers which latter are of such character as to occupy but little space, and are closely grouped together.

I employ on each side of the center of the instrument different groups of levers to ac-
 15 complish this purpose. This particular arrangement may be somewhat modified, but I prefer to use the following:—on one side, five groups of five levers each; two groups of three levers each, two groups of two levers
 20 each; one group on the right of the center of six levers, and four central levers, arranged to oscillate at right angles to the others. The arrangement of levers on the opposite
 25 side of the center of the instrument is in all respects the same, except that instead of one group of six levers, five only are contained in such group.

The several levers of each of the above described groups are parallel to each other in the same plane while the several groups lie in different planes. To distinguish these groups I have marked them in Fig. 2 as follows: The groups of five levers are designated by the numerals 1, 2, 3, 4, 5; those of three levers by
 30 6, 7; those of two by 8, 9; the right-hand group of six levers by 10; the left-hand group of five levers by 11, and the four central levers by the numerals 12, 13, 14, 15, attached to the plungers that operate them. All of the levers
 40 described are levers of the first order with the exception of the two single groups of five and six respectively, which are of the second order, but these are connected by wires, not shown in drawings, with intermediate levers
 45 pivoted on an axis *b* and parallel with the four levers of keys 12, 13, 14 and 15. Each lever is connected with one of a series of markers C, which are adapted, as hereinafter set forth, to make an impression or imprint on a trav-
 50 eling sheet of paper or other material when its particular lever is oscillated.

The mechanical connections between the plungers and the markers are substantially the same in all cases, and will be understood
 55 by a description of one. Each plunger B is provided with a rubber head *b'* so as to avoid making a sound when struck by a key. It also passes through a small tube or sleeve D secured to the plate A', and below the said
 60 sleeve a nut D' is secured to the plunger rod above which is a felt or leather washer D'' which deadens the sound when the plunger returns to its normal position after being depressed.

65 The lower end of the plunger rod carries a saddle *c* that engages with a lever E mounted on an axis E'. The opposite end of this lever

is connected by a wire *c'* with the end of a second lever E'' turning on an axis *c''*. The end of this second lever is formed like a hook
 70 or is otherwise adapted to serve as a marker or marking point.

The relative positions of the parts are shown in Fig. 5. When the plunger B is struck by the depression of one of the piano
 75 keys F the marking point of the lever E'' is forced into contact with the roll F' which carries the paper and continues thus as long as the key F is held down. As soon as the latter is released the parts are caused to re-
 80 sume their normal positions by a spring F'' connecting the marking point with a stationary support.

In order to secure a certain degree of ad-justability of the plungers with reference
 85 to the keys of different pianos, each of the sleeves D is passed through a slot as *d* in the plate A' and is provided with a collar *d'* beneath the plate and a nut *d''* above it. By loosening this nut the sleeve and plunger
 90 may be adjusted to the desired point in the slot and then secured. In order to secure greater freedom of movement for the plungers and levers, the latter are made in different lengths, while to compensate for such dif-
 95 ference the plungers stand at different heights above the plate A' and are placed at varying distances from the pivotal axes of the levers. The extent of movement of the levers is thus
 100 equalized by the greater or less range of vertical movement of the plungers, some of which will be encountered by the piano keys sooner than others, and also by the distance of the plungers from the fulcrum of the lever.

In the box or case A and beneath the row
 105 of marking points is the paper-carrying mechanism. The paper is reeled on a roll G and is carried over and around the impression roll F' to the roll G' upon which it is wound. The proper movement of the paper web is ef-
 110 fected by means of a clock-work wound by a key or a handle H, and imparting rotation to the roll G' through a suitable pinion H'. To preserve a uniform movement of the roll G a spring-brake H'' presses upon an exposed
 115 portion of the surface of said roll, and suitable means such as a fan or centrifugal regulator is employed in connection with the clock-work for varying or adjusting the speed
 120 of movement of the paper.

Any desired device such as an ordinary inking ribbon may be employed in conjunction with the markers for obtaining a clear and distinct record.

The mechanism above described constitutes
 125 the means for recording the depression of keys. The position of a mark to the right or left indicates the particular key touched or the note corresponding thereto. The length of the mark indicates the duration of depression
 130 or the length of the corresponding note. Now, in order to indicate the measure or tempo, I employ the following device: On the axle of the roller G' is secured a ratchet wheel

I with the teeth of which engages a curved arm or pawl I' which is rigidly secured to the projecting end of a rock-shaft K. This latter carries two pointed pins K' K' which act upon the traveling paper as markers. A spring K'' is connected with the arm I' and holds it in contact with the ratchet wheel I. It also tends to lift the marking points K' away from the paper. As the teeth of the wheel I successively pass under the arm I' the latter causes the points K' to make marks or dots upon the paper near its edges which indicate the divisions or beats of a measure, while at the same time the performer is notified of each beat by the sound of a bell L which is struck by a hammer L' attached to the arm I' and which serves as a metronome.

Should the performer prefer to dispense with the automatic marking of the time, and beat time with his foot, he may do so by pressing a pedal L'' which is connected by a cord e with an arm e' which is carried by the shaft K and which may be made fast to the same when desired. A spring e'' counterbalances the pedal and arm, and a stop f limits the movement of the shaft and marker K'. When these devices are used the arm I' is disconnected from the shaft K. A stop m'' of suitable character projects from the instrument in a position to be moved by the knee of the performer. By shifting this the instrument will be stopped or started. No special device is required for this purpose.

Figs. 14 to 18 inclusive illustrate the mechanism for deciphering the record made by the markers on the sheet. This device is composed essentially of a rectangular frame the sides of which are straight edges on which are or may be marked scales of equal parts. The sides of the frame are two plates M M' on which, or generally on one of which only, are division marks corresponding in number to the markers in the recording mechanism, and with two wider divisions at the ends for the time markers. The side bars or plates N N' of the frame are similarly divided in scales of equal parts to serve as a measure of the length of notes. Brackets are secured to the plates M M' near their ends to afford bearings for guide rolls M'' for the paper, (see Fig. 11) and for the support of a wooden platen or table N''. Guide plates O O are secured to the sides of the frame, and immediately adjacent to the scale M and through them passes and by them is held a ruler or flat strip O'. On the frame are also provided bearings for a spindle O'', having grooved or sprocket wheels P at their ends connected by bands or chain belts m with similar wheels P'. To these belts are attached the guides P'' through which passes a ruler Q, which may be adjusted to any desired distance from the ruler O' by turning either of the wheels P by a handle as m', and which is maintained in parallelism with the ruler O'. The rulers O' and Q, one or both, are marked off into divisions equal to those on the plate M and

the notes or their names are marked on them corresponding to each division. The number of such divisions is, however, greater than on the plate M in order that the apparatus may be adapted to instruments with different numbers of keys, without reference to the note from which it begins. This frame is adapted for attachment to the under side of the case A, from which it is or may be detached except when in actual use, the manner of its use being as follows: When a desired length of paper has been marked in the manner indicated above, the rollers G and G' with their frame are detached from the clock-work, taken from the case A and placed upside down on a table. The web of paper is then rewound from roll G' back onto roll G. The deciphering device is then secured to the frame and the web of paper carried up over and around the guide rolls M'' and platform N'' and again secured to the roll G' on the axis of which a handle may be secured. The rulers O' Q which, as above stated, have divisions equal in width to but greater in number than those on the plate M, are then adjusted transversely so that the first of the eighty-five divisions on the plate M will lie opposite the division on the ruler on which the note is marked corresponding with the lowest key of the keyboard of the piano. The paper is then moved over the platform N'' by turning the roll G' and all the marks thereon will occur between the divisions of the plate M and rulers O' Q. For better indicating the divisions, dotted lines are drawn across the instrument and these may represent threads actually stretched in such positions, although the use of these is not ordinarily required. Since the notes are marked on the rulers O' and Q, as indicated in Fig. 15, the position of a dot or a line between the division lines determines the corresponding note, while the length of the note is determined by the relative length of the mark on the paper measured by the scales on the side plates N N'. In order to divide the piece by measure the ruler Q is to be the proper distance from the ruler O'.

In the recording apparatus the time marks make dots on the edges of the paper corresponding to the beats, so that, for example, a measure of four-four time is indicated by four dots. In such case, therefore, the paper is moved to bring the first pair of dots made by the time-markers to the edge of the ruler O'; the ruler Q is then moved from the ruler O' through the space of four dots, and all the marks exposed between the two rulers will be the notes included in this measure. When all the notes have been transcribed the paper is moved to expose the marks of the next measure, and so on. The movement of the paper is kept uniform and prevented from inequality by the arm I' engaging with and passing over the teeth of the wheel I.

It will usually be more convenient to tran-

scribe the notes by placing the rollers and their frame in a vertical position and on the left of the writer, as the marks exposed in one division and belonging to the same chord will lie in a vertical line as they do in music.

In order to assist the copyist, there may be substituted for the rulers O' and Q above described, rulers of the characters shown in Figs. 16 and 17. These rulers are divided into equal parts in the same way as those previously described, but the divisions are distinguished by different colors. Five black sections, for example, correspond with the five lines of the treble staff; five red sections to the lines of the bass staff; while the additional lines above and below the treble staff are colored blue, those additional to the bass yellow, and the sections corresponding to spaces between the lines are white. The lines of both staves are indicated by Roman numerals I, II, III, IV, V, placed on the corresponding sections, while the lines above and below are indicated by Arabic numerals. Each section consists of two divisions corresponding to a tone and semi-tone, except, of course, those for B and E, which have but one division each, for when these notes are raised a half tone they change their position on the musical scale, that is, they become C or F. The lower or movable ruler is arbitrarily marked so as to assist the eye in determining the divisions. The rulers in such an arrangement represent on a larger scale, the usual musical staff of five lines with all the additional lines above and below. The signs made on the paper which are to be deciphered, passing under the divisions of the rulers, occur in the spaces between them according to their tone, exactly as they are to be written down on the music sheet. The deciphering of the marks by means of these rulers is convenient and easy, for the reason that the colors of the sections are at once apparent, while the number or figure indicates at a glance the line or space where the note belongs.

Fig. 18 represents a portion of a paper sheet T which has been marked and beneath it the corresponding music written out in the ordinary way.

S S indicate the marks that stand for notes, and S' are the time dots. For purposes of illustration the lines have been drawn across the paper to indicate the imaginary division lines.

From the fact that the rulers are adjustable transversely, and provided with longer scales or series of divisions than the plates M it follows that a performer may transpose a composition from one key to any other by the proper adjustment of the rulers with reference to the paper and the plates M.

The entire apparatus is adapted to be contained in the wooden case or box A. The clock-work is secured in the box and to the bottom of the same, but the system of rollers is removable, as above set forth. Any suit-

able devices may be used to secure it in place, or to adjust it in the proper position in the box.

The apparatus when placed under a piano occupies but little space, not interfering at all with the free use of the instrument. It may be adjusted to any piano or other instrument provided with keys, the only thing necessary for its application being to remove the board of a piano case under the keys or to cut a slot of proper width in the same. The plungers may be lowered so as not to be touched by the keys by adjusting the height of the standards A" which support the device.

Larger pianos might require a greater number of levers, but as the extreme notes are seldom used this will seldom be necessary. It is even possible without impairing, but in fact increasing the efficacy of the instrument, to utilize one or two end levers to record the depressions of the pedals, which for this purpose would be connected to such levers in any convenient manner.

Any other suitable material may be used to receive the record, but paper I consider to be the best in practice.

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

1. In a melograph the combination with a series of plungers standing at different heights and out of alignment and adapted to be placed in position under the keys of a piano, of compensating levers one for each plunger, a series of levers with marking points grouped near the center of the series of plungers and with their points in alignment, and connections between the same and the compensating levers, as set forth.

2. In a melograph the combination with a series of plungers adapted to be placed in position under the keys of a piano, of groups of levers, one lever for each key, the levers of each group being parallel and in the same plane, and the several groups lying in different planes, a series of marking levers parallel to each other and with their marking points in alignment grouped near the center of the series of plungers, connections between the marking levers and the others and a traveling surface or web for receiving the impressions of the marking points, as set forth.

3. In a melograph the combination with a series of plungers standing at different heights and out of alignment, and adapted to be placed in position under the keys of a piano, of a series of levers, one lever for each plunger, the levers being of varying lengths and extending toward the center of the series of plungers, marking levers with their marking points in alignment grouped in parallelism near the center of the group of plungers, connections between the same and the other levers, and a traveling web of paper for receiving in transverse lines the impressions of the marking levers, as set forth.

4. In a melograph the combination with a

series of plungers adapted to be placed under the keys of a piano and extending over a space equal to the length of the key-board, a series of parallel marking levers grouped together near the center of the series of plungers, and levers intermediate to the plungers and marking levers, those of the intermediate levers near the ends of the series being levers of the first order, those nearer the center being levers of the second order, and a given number in the center being mounted at right angles to the planes of all the others, as set forth.

5. A device for deciphering the marks or impressions of the marking levers of a melograph, substantially as herein described, consisting of the combination with a rectangular frame through which the paper is drawn, of a fixed transverse scale of equal parts, a movable scale parallel therewith, and one or more side scales of equal parts or divisions, as set forth.

6. In a melograph the combination with a

box or case and a series of marking levers contained therein and adapted for attachment to a piano, of a series of plungers for operating the marking levers, the said plungers being disposed so as to lie under the keys when the instrument is attached to the piano, and adjustable vertically and horizontally with respect to the keys by which they are encountered, as set forth.

7. The combination in a melograph of a series of vertical plungers adapted to be placed in position under the keys of a piano, and a series of marking levers operated by said plungers, of a box or case for containing the said devices, and vertically adjustable supports or legs for the box by which the plungers may be simultaneously brought into or withdrawn from the path or range of movement of the piano keys, as set forth.

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Witnesses:

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