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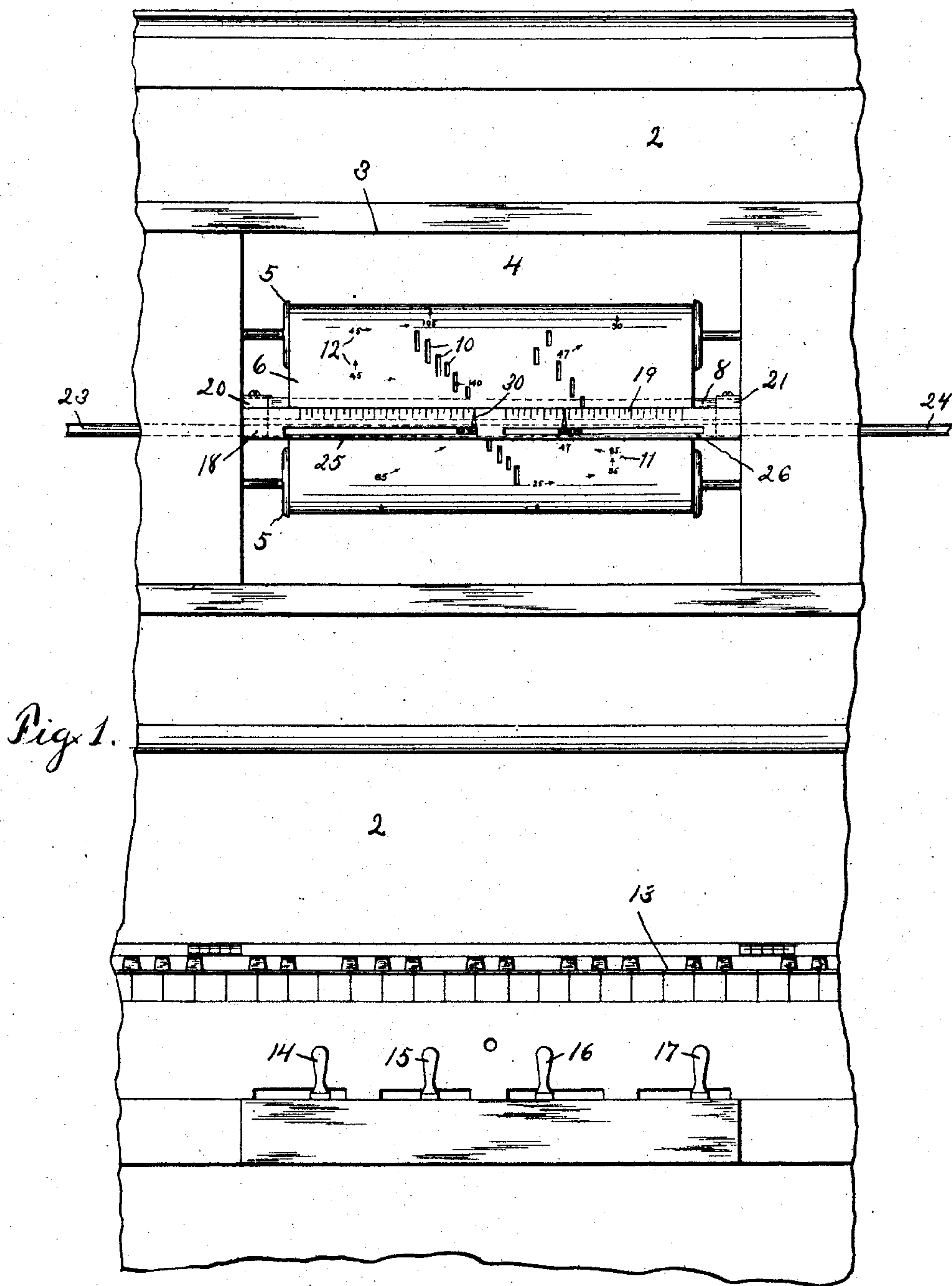
PATENTED APR. 7, 1908.

W. S. DENTON.

MODULATION INDICATOR FOR AUTOMATIC MUSIC PLAYING MECHANISMS.

APPLICATION FILED JAN. 16, 1906.

3 SHEETS—SHEET 1.



Witnesses
Arthur F. Heaton.
Ethel B. Reed

William S. Denton, Inventor
By his Attorney Russell M. Everett.

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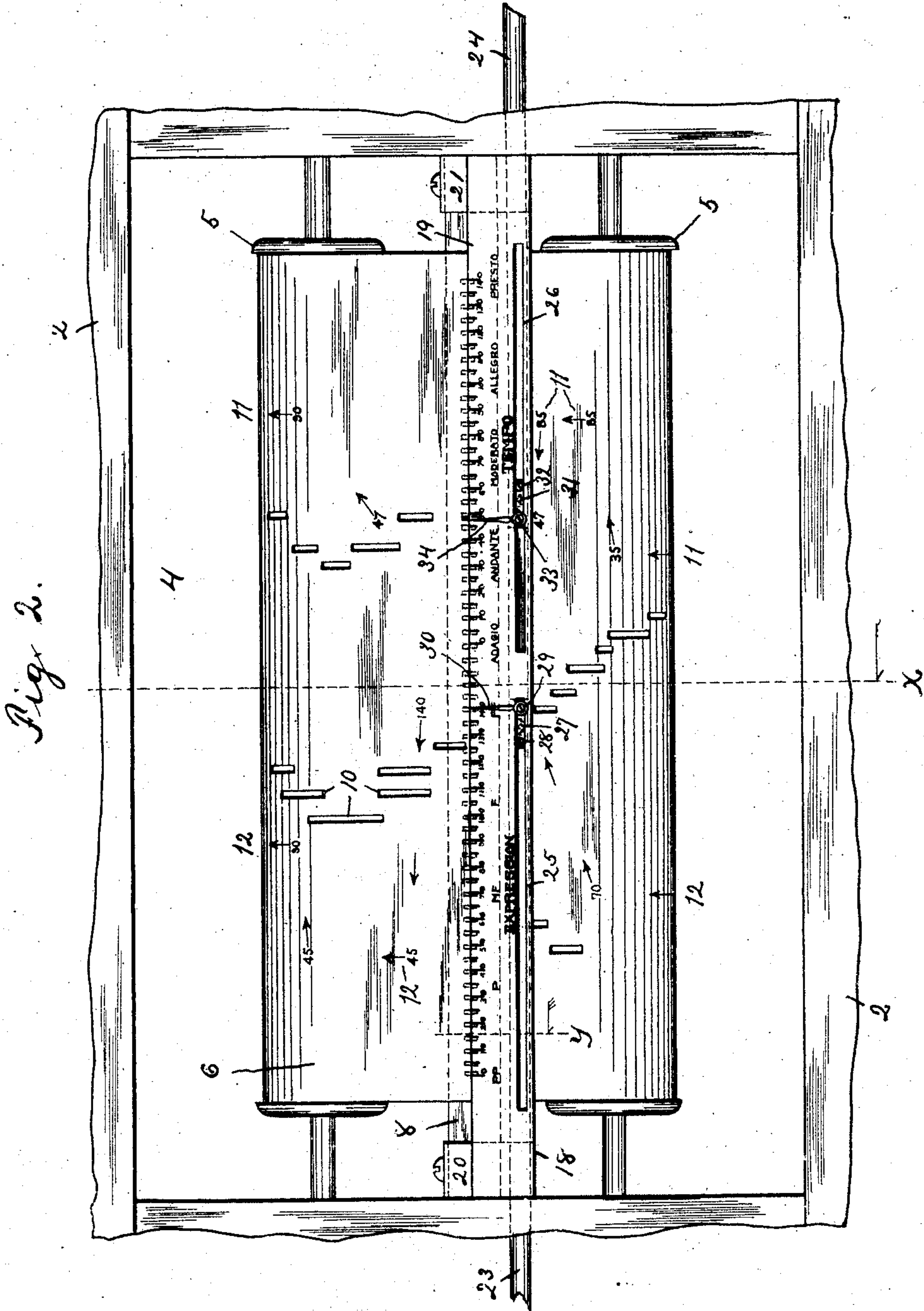
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3 SHEETS—SHEET 3.

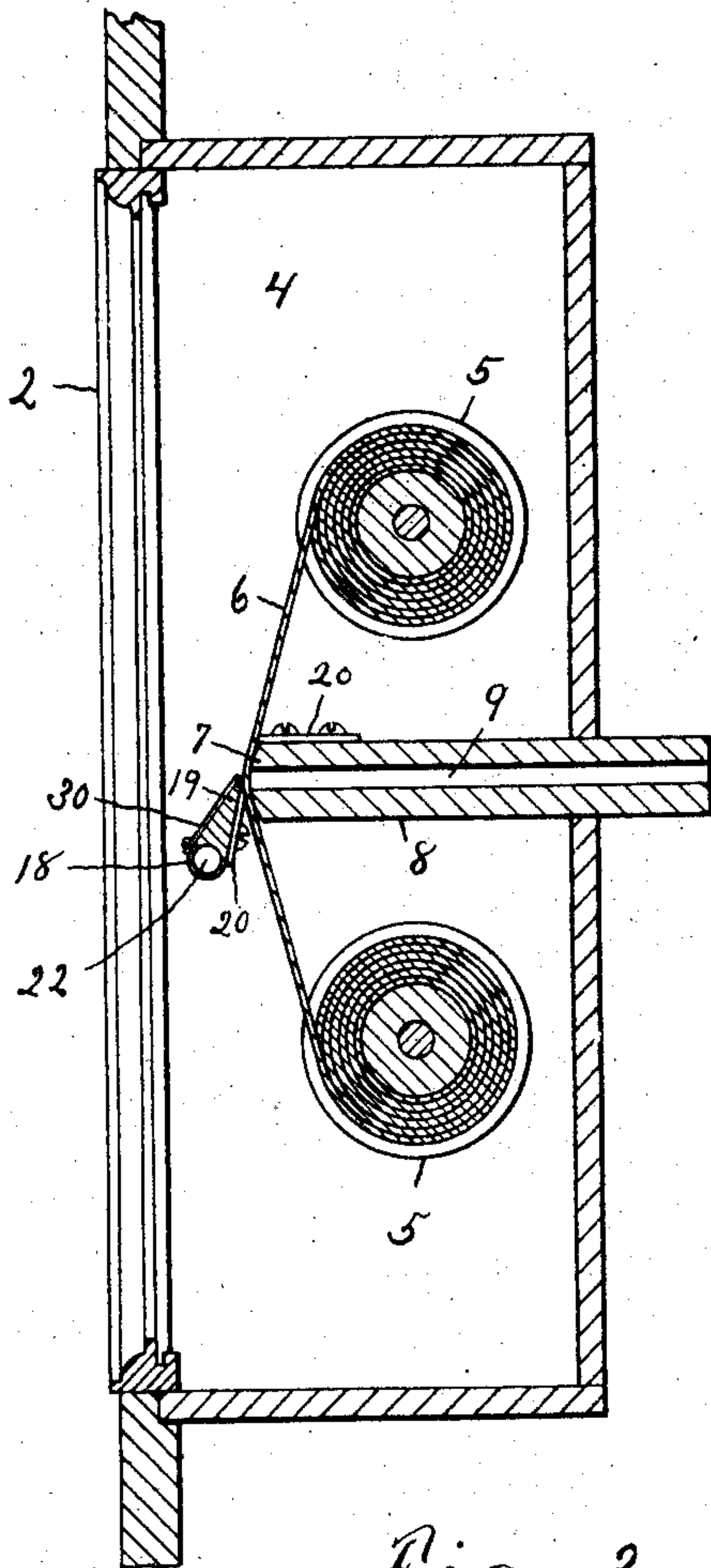


Fig. 3

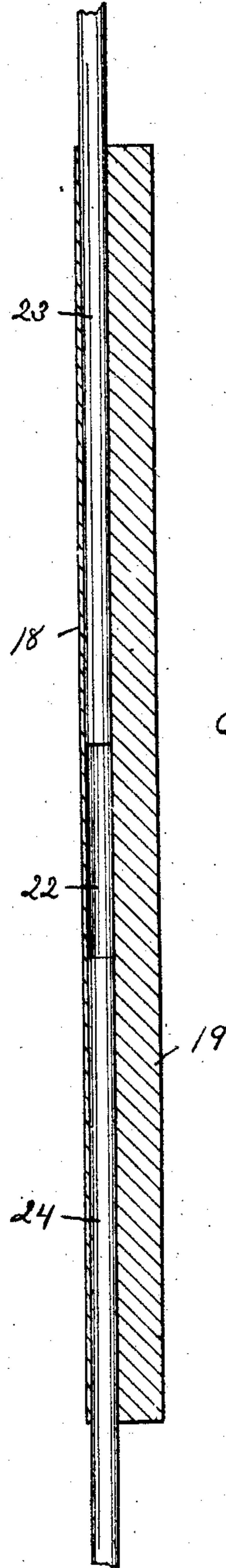


Fig. 6.

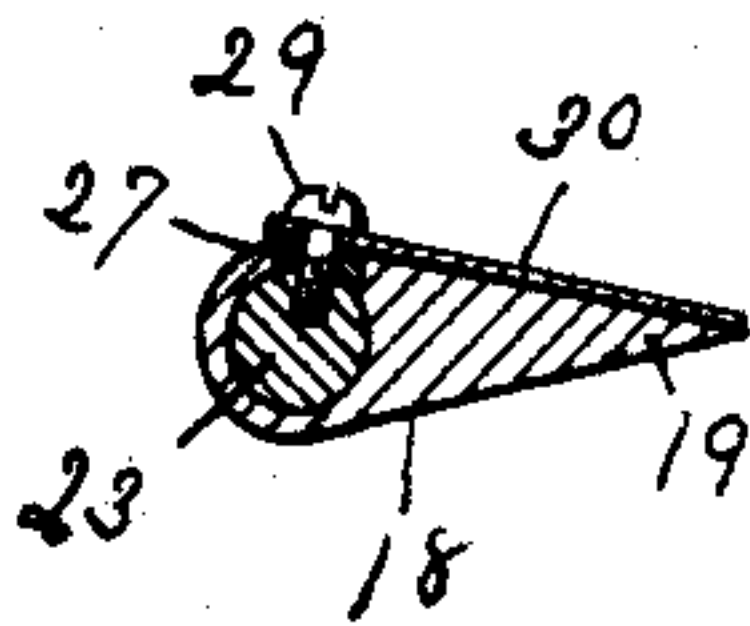


Fig. 4.

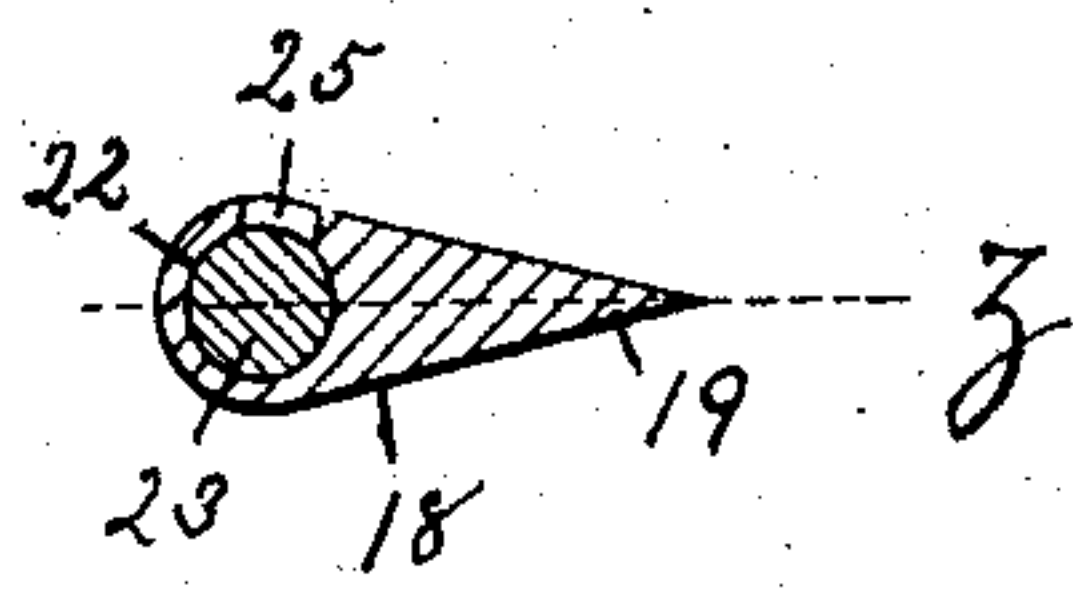


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM S. DENTON, OF NEW YORK, N. Y.

MODULATION-INDICATOR FOR AUTOMATIC MUSIC-PLAYING MECHANISMS.

No. 884,135.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed January 16, 1906. Serial No. 296,433.

To all whom it may concern:

Be it known that I, WILLIAM S. DENTON, a citizen of the United States, residing at New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Modulation-Indicators for Automatic Music-Playing Mechanisms, of which the following is a specification.

This invention relates to automatic music playing mechanisms of that class in which a perforated music-sheet is employed as a controlling medium, and more particularly the invention relates to the means for regulating or governing the expression and tempo of the music and for indicating to the player in what expression and tempo the piece is being played.

The objects of the invention are to secure a simplified indicator and one which shall not require the operator to watch a multiplicity of scales and pointers arranged distant from one another; to locate the scale at that precise point of the music-sheet at which playing is actually taking place; to thus eliminate the need for calculation and expertness on the part of the operator; to place the entire indicator close to the music-sheet, and in the natural line of vision; to secure a simple, inexpensive and accurate construction, and to obtain other advantages and results.

The invention consists in the improved modulation indicator for automatic music-playing mechanisms, substantially as will be hereinafter described and finally set forth in the claims.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a front elevation of a portion of the upper part of an automatic piano showing a music-sheet upon its rolls or spools, with my improved indicator fitted in place, and also showing the key-board with the usual governing levers for the playing mechanism below it; Fig. 2 is an enlarged front elevation of the rolls or spools with a music-sheet thereon and showing my improved indicator mounted upon the tracker-board; Fig. 3 is a cross-section taken on line *x*, Fig. 2, looking in the direction indicated by the arrow; Fig. 4 is a cross-sectional view of the indicator taken through one of the pointers; Fig. 5 is another cross-section taken at line *y*, Fig. 2, looking in the direction of

the arrow; and Fig. 6 is a longitudinal section of the indicator, upon line *z*, Fig. 5.

In said drawings, 2 indicates the piano casing apertured as at 3, to provide an interior chamber 4, in which the spools or rolls 5, 5, are arranged and upon which the music-sheet 6, travels, said rolls being driven by any ordinary mechanism, not shown. It will be understood that the said music-sheet, in traveling, passes over the front edge 7, of a tracker-board 8, horizontally disposed between the two spools 5, 5, and perforated as at 9, to receive the suction or air current which serves to actuate the hammers, as is common. The music-sheet 6, has perforations 10, adapted to register with said passages 9, of the tracker-board, as desired, and so permit the air-current to operate the hammers of the piano, as will be understood. Series of numbers 11, 12 upon the music-sheet, with arrows adjacent thereto to show direction, serve to indicate to the player's eye the variations in tempo and expression, the series 11, at the right hand in the drawings showing tempo and the other series, 12, expression.

Beneath the key-board 13, of the piano are shown the usual levers 14, 15, 16, and 17, which serve to give the operator control of the playing mechanism. The first of these levers 14, is simply a pedal lever and plays no part in the present invention, and similarly the opposite end lever 17, is the re-roll lever, which is also immaterial for the purposes of this invention. Of the two intermediate levers, however, one, as 15, controls that mechanism of the piano by which the expression of playing is changed, while the other, 16, similarly controls the said mechanism to vary the tempo in which the piece is played.

In order for the operator to have some guide as to the extent to which he is varying or changing the said expression and tempo regulators, it has been common to arrange at some place on the instrument, scales upon which pointers were adapted to move in unison with the changes of expression and tempo. Furthermore, other pointers have been arranged in conjunction with the first said pointers to follow guiding lines upon the music-sheet, and the result has been an awkward complication of pointers which it was very difficult for the eye to follow.

In my improved construction, I mount

upon the front edge of the tracker-board 8, at a little distance therefrom and parallel thereto, a bar 18, which at its upper reduced edge 19, lies along the row of apertures 9, in the tracker-board, and between itself and the tracker-board forms a narrow slit or passage way for the music-sheet, as clearly shown in Fig. 3. To hold said bar firmly in such position it may be mounted in any suitable manner upon the interior of the chamber 4, although I prefer, and have shown, feet 20, 21 connecting the bar at its opposite ends to the ends of the tracker-board. Upon the face of this bar 18, and close to its upper edge, are marked both tempo and expression scales, the former being shown as at the right hand and the latter at the left hand, in the drawings. The lower portion of the said bar 18, is longitudinally bored out or channeled as at 22, to form a slide-way for the ends of rods 23, 24 which extend from the governing mechanism of the instrument, one as 23, from the expression controlling means, and the other, as 24, from the speed controlling means. The face of the bar 18, is slotted near each end in alinement with the rods, 23, 24, sliding therein, as at 25, and 26 respectively, and in each of said slots is arranged a shoe 27, (or 31), which nicely fits said slot or slideway and is longitudinally concaved at its under side to rest upon its rod beneath. Screws 28, 29, (or 32, 33), are then passed through said shoe into the rod, and upon one of said screws, preferably the end one, is mounted a pointer 30, (or 34) which extends at right angles to the bar 18, with its extremity upon the scale at the upper edge of the bar.

It will be understood that as the operator varies the tempo and expression of the music by means of the levers 15, and 16, the rods 23, 24 and their pointers will be correspondingly shifted to show the player what he is doing. Moreover, the said pointers are arranged closely adjacent to the music-sheet, so that the operator can watch both at the same time and more closely associate the modulation of his playing with the sheet of music before him. Furthermore, if the series 11, 12, of numbers are upon the music-sheet and he wishes to play in an entirely mechanical manner, he can simply hold the pointers upon the said series and do the same with great exactness and facility. Again it will be noted that the upper edge of the bar 18, which has the tempo and expression scales, is arranged exactly along the middle of the tracker-board 8, so that the position of the pointers shows exactly what is being played at that instant and not the expression and tempo of something which is to be played later.

Although for the sake of greater clearness and definiteness I have described my invention as applied to a piano, it is obviously ap-

plicable to organs or other automatic instruments, and to outside players, or to any automatic music playing mechanism whatever employing a perforated music sheet as an actuating medium.

Obviously various changes in the detail construction of my indicator could be made without departing from the spirit and scope of the invention, and I do not wish to be understood as limiting myself by positive descriptive terms employed except as the state of the art may require.

Having thus described the invention, what I claim is:—

1. In an automatic music-playing mechanism, a tracker-board with an edge over which a music sheet is adapted to travel, a scale having a graduated edge parallel and closely contiguous to said edge of the tracker board, a pointer upon said graduated edge, governing means for the playing mechanism, and connections between said pointer and governing means.

2. In an automatic music-playing mechanism, a tracker-board having an edge over which a music sheet is adapted to travel, a scale having a graduated edge parallel and closely contiguous to said edge of the tracker-board connections between the scale and the ends of said tracker-board, a pointer for said graduated edge of the scale, governing means for the playing mechanism, and connections between said pointer and governing means.

3. In an automatic music-playing mechanism, the combination of a music sheet a tracker-board, a scale arranged closely contiguous to said tracker-board, markings on the music sheet and a pointer whose index finger indicates on both said scale and said markings on the music sheet, simultaneously.

4. In an automatic music-playing mechanism, the combination of a music sheet, markings thereon a tracker-board, a scale closely contiguous to said tracker-board and having a graduated edge, and a pointer projecting onto the said graduated edge of the scale from the side of the tracker-board opposite that from which the note sheet approaches and indicating on both said graduated edge of the scale and the music sheet passing over the tracker-board, simultaneously.

5. In an automatic music-playing mechanism, the combination of a tracker-board, spools upon opposite sides of said tracker-board adapted to cause a music sheet to travel over the edge of the tracker-board, a scale mounted upon said edge of the tracker-board parallel thereto having one edge lying adjacent to the music sheet and in substantially the same horizontal plane with the edge of the tracker-board and the other edge providing a slideway, a support in said slideway a pointer mounted on said support with its free end overlying the other edge of the scale, governing mechanism and means

connecting said pointer support with said governing mechanism.

6. In an automatic music-playing mechanism, a tracker-board over the front edge of which a music sheet is adapted to travel, a bar connected to said tracker-board at opposite sides of the music sheet, the upper edge of said bar being in line with the perforations of the tracker-board and having a scale marked thereon, a slideway at the lower edge of said bar, a rod terminating in said slideway, a pointer upon said rod extending onto said scale, governing mechanism, and means for connecting the said rod to said governing mechanism.

7. In an automatic music-playing mechanism, the combination of means for determining the path of a traveling music sheet, a bar arranged transversely of the said path and having a longitudinally bored edge and a transversely tapered opposite edge with a scale thereon, a rod in said bored edge, a pointer on said rod for the scale, governing mechanism, and means for connecting the said pointer to said governing mechanism.

8. In an automatic music-playing mechanism, the combination of a tracker-board having an edge over which a music sheet travels, a bar parallel and closely contiguous to said edge of the tracker-board and providing side by side upon itself a longitudinal scale and a longitudinal slideway, governing means for the player, a rod having one end portion in said slideway and its other end connected to said governing means, and a pointer for said scale carried by the said end of the rod in said slideway.

9. In an automatic music-playing mechanism, the combination of means for determining the path of a traveling music sheet, a tubular bar arranged transversely of the said path and being longitudinally slotted near each end to provide slideways, rods one in each end of the tubular passage of said bar, shoes mounted on each rod and fitting the adjacent slideway, and pointers mounted on said shoes.

10. In an automatic music-playing mechanism, a tracker-board having a front edge through which the perforations of the tracker-board open, brackets upon said edge of the tracker-board outside the said perforations, a bar supported by said brackets parallel to the tracker-board and providing a scale adjacent to the perforations thereof and a slideway, a rod in the slideway a pointer for said scale mounted on the rod, governing mechanism for the player, and means connecting said pointer rod to said governing mechanism.

11. In an automatic music-playing mechanism, the combination of means for determining the path of a traveling music sheet, a bar arranged transversely of said path and providing a longitudinal slideway for sub-

stantially the entire width of the music sheet, independent pointers, rods supporting the latter and arranged one in each end of said slideway, regulating means for expression and for tempo, respectively, and means connecting one pointer-rod to each of said regulating means.

12. In an automatic music-playing mechanism, the combination of a tracker-board, a scale arranged closely contiguous to said tracker-board and having at one end of itself expression graduations and at the other end tempo graduations, movable pointers one on each end of said scale, and regulating means for expression and tempo, respectively, said pointers being connected one to each of said regulating means.

13. In an automatic music-playing mechanism, the combination of a tracker-board, a scale having one edge in substantially the same horizontal plane with the tracker-board and closely adjacent thereto, one end of said edge having expression markings and the other end tempo markings, pointers upon said scale whose index fingers indicate upon the said markings and a note sheet on the tracker board, simultaneously, regulating means for expression and tempo, respectively, and means connecting said pointers to said regulating means.

14. In an automatic music-playing mechanism, the combination with a traveling music sheet having on itself a plurality of longitudinal markings indicating expression and tempo modulations, of a tracker board over which said sheet travels, a scale arranged parallel and closely contiguous to said tracker board and having its ends marked for expression and tempo, respectively, in accordance with the lines on the note sheet, independent expression and tempo pointers, each having a single index finger indicating upon both the scale and the note-sheet, simultaneously, governing mechanism, and means connecting said pointers to said governing mechanism.

15. In an automatic music-playing mechanism, the combination with a traveling music sheet having on itself a longitudinal line of markings, of a tracker-board over which said sheet travels, a scale arranged parallel and closely contiguous to said tracker-board, a pointer whose index finger indicates upon both said scale and note-sheet, simultaneously, governing mechanism, and means connecting said pointer to said governing mechanism.

16. In an automatic music-playing mechanism, the combination with a traveling music-sheet, of a tubular bar arranged transversely of such sheet adjacent to the same and being longitudinally slotted at each end to provide slideways, rods one in each end of the tubular passage of said bar, shoes mounted one on each rod and fitting the ad-

jacent slideway, pointers mounted on said shoes, and means for sliding said rods.

17. In an automatic music-playing mechanism, the combination with a traveling
5 music-sheet, of a tubular bar arranged transversely of such sheet adjacent to the same and being longitudinally slotted in each end to provide slideways, rods one in each end of the tubular passage of said bar, shoes mount-
10 ed one on each rod and fitting the adjacent slideway, pointers mounted on said shoes, means for sliding said rods, governing mechanism for the player, and means connecting said rods to said governing mechanism.

18. In an automatic music-playing mechanism, the combination with a traveling
music-sheet, of a bar arranged transversely of said sheet adjacent thereto and having a
longitudinally bored edge and a transversely
tapering opposite edge with a scale thereon, 20
a rod in said bored edge, a pointer on said rod for the scale, governing mechanism, and means connecting said pointer to said governing mechanism.

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Witnesses:

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