A. T. YOUNG.

PLAYER FOR PIANOS.

APPLICATION FILED MAR. 11, 1909.

963,493.

Patented July 5, 1910.

3 SHEETS—SHEET 1.

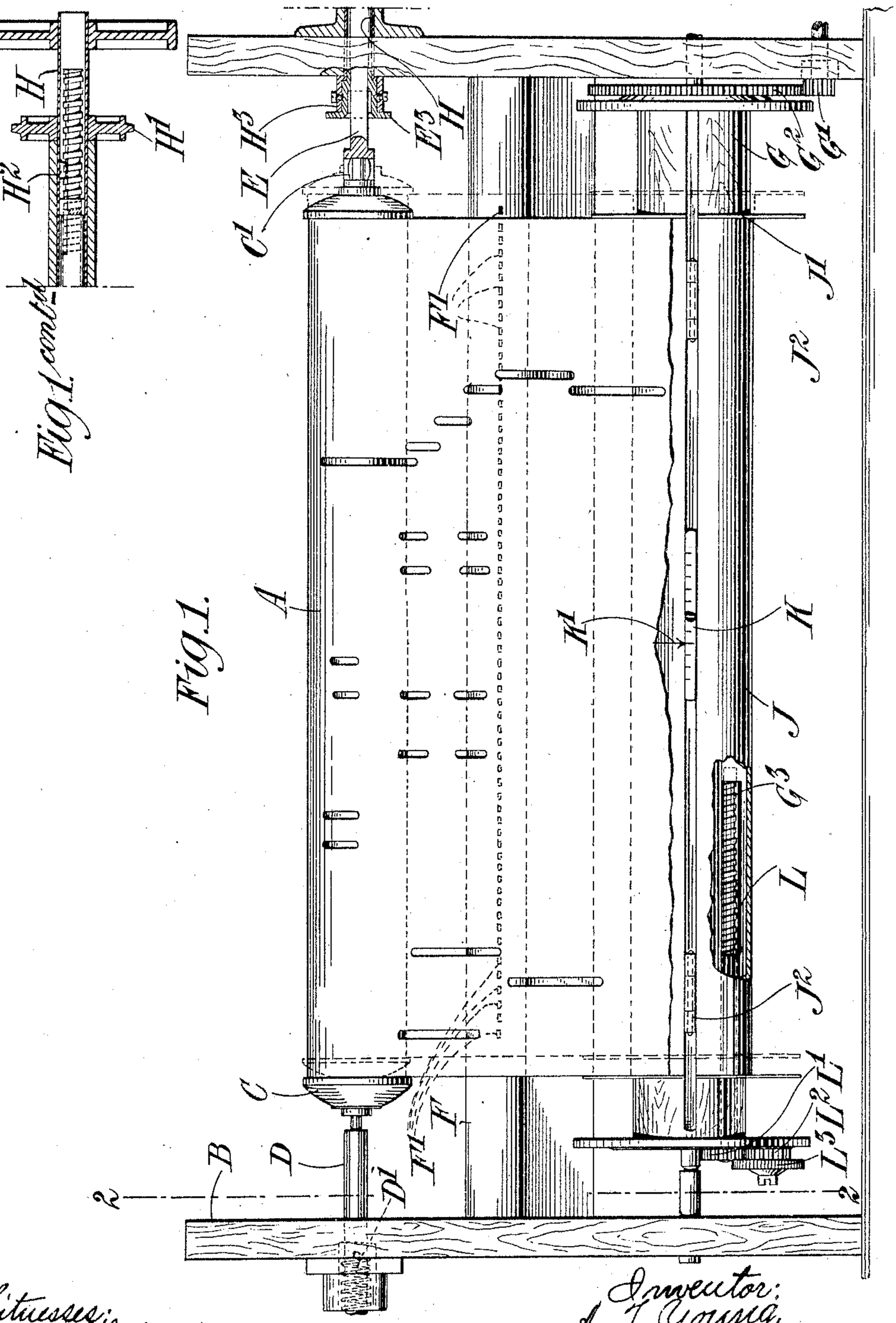

Fig. 1.

Witnesses:
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3 SHEETS—SHEET 2.

Fig. 2.

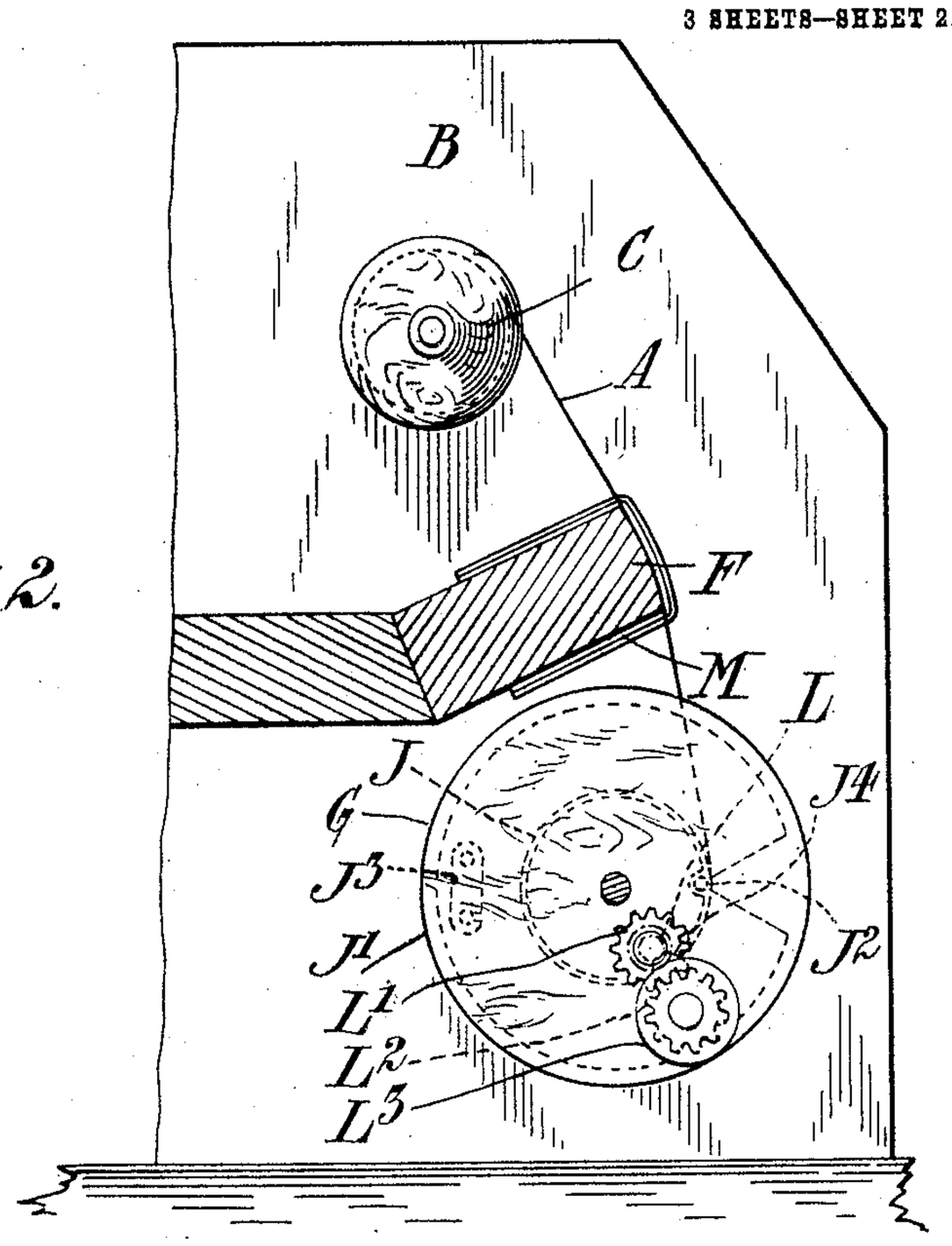


Fig. 4.

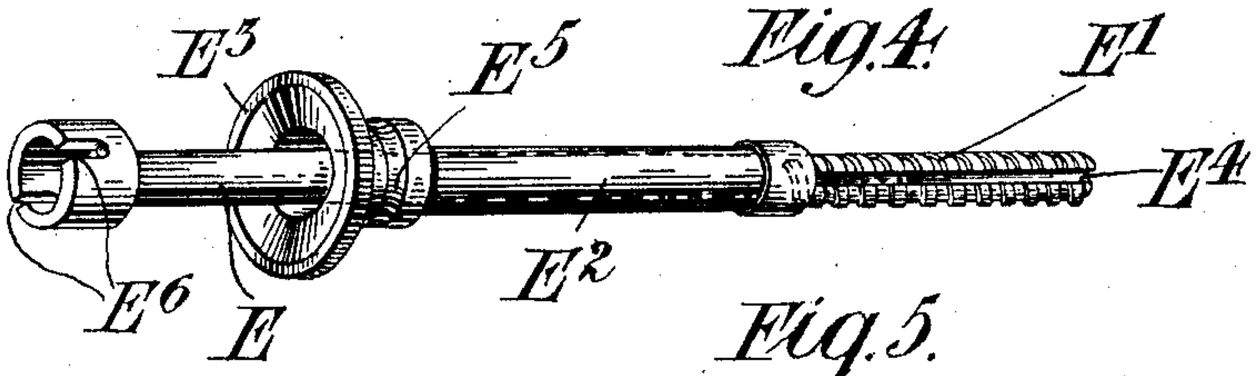
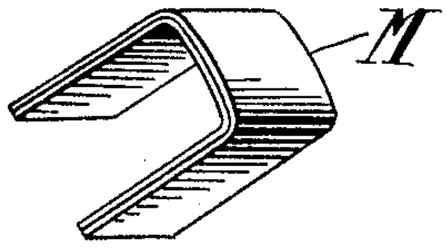


Fig. 5.

Fig. 6.



Witnesses,
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3 SHEETS—SHEET 3.

Fig. 3.

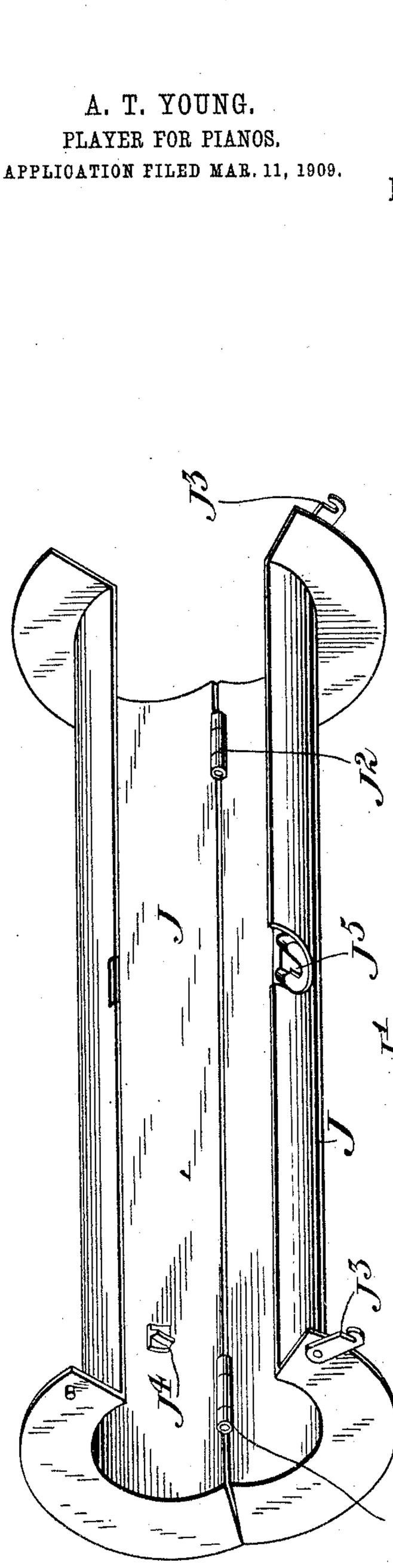
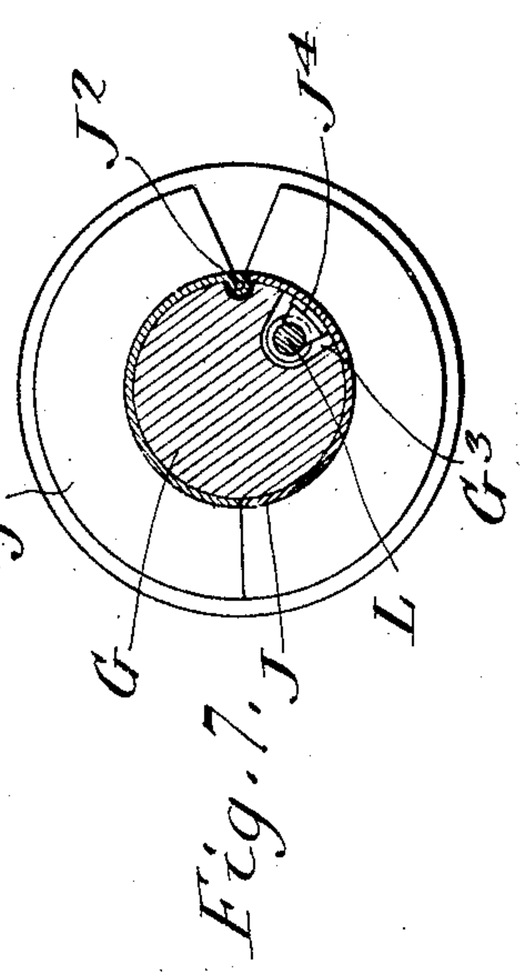


Fig. 7.



Witnesses:
H. S. Shepard.
W. J. Harriman.

Inventor,
A. T. Young,
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UNITED STATES PATENT OFFICE.

ADAM TURQUAND YOUNG, OF LONDON, ENGLAND.

PLAYER FOR PIANOS.

963,493. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed March 11, 1909. Serial No. 482,760.

To all whom it may concern:

Be it known that I, ADAM TURQUAND YOUNG, a subject of the King of England, residing at London, England, have invented certain new and useful Improvements in or Relating to Players for Pianos, of which the following is a specification.

This invention is for improvements in or relating to players for pianos or the like and has for its object to provide improved means whereby the music-sheet controlling the player may be utilized for producing the same piece of music in several keys.

As is well known, the music-sheet in these instruments passes over a tracker-board whereby the notes to be sounded are selected, and provision is sometimes made for laterally displacing the music-sheet relatively to the tracker-board for the purpose of effecting the requisite change of key.

This invention is for a specific construction of mechanism for effecting the lateral displacement of the music-sheet, the details of such mechanism being hereinafter described with reference to the drawings and the novel features pointed out in the claims.

In the accompanying drawings:—Figure 1 is a front elevation showing the music-sheet and its accompanying parts in part section, Fig. 2 is a transverse section on the line 2—2 of Fig. 1, and Fig. 3 is a detail perspective view of the sleeve for the receiving roller. Fig. 4 is a detail perspective of the spindle for the feed roller. Fig. 5 is a detail perspective view of the hollow driving spindle, and Fig. 6 is a detail perspective view of a seal for the orifices in the tracker board. Fig. 7 is a transverse section on the line *x*—*x* of Fig. 1.

Like letters indicate like parts throughout the drawings.

The music-sheet A with its accompanying parts is mounted in a box or casing B, as is usual in piano-players, and it is carried by a feed roller C which, as is usual practice, is detachably mounted between centers D and E. The music-sheet passes over a tracker-board F having the usual series of perforations F^1 each of which pneumatically controls the mechanism for one note. In operation the free end of the sheet is attached to the receiving roller G which receives its motion from a pinion G^1 that gears with a toothed wheel G^2 on the roller. The feed roller C is adapted to be positively driven from a hollow spindle H that has fast upon it a sprocket wheel H^1 that is geared by a chain to the driving mechanism.

The receiving roller G is made of such dimensions as to just receive the width of sheet intended to be used with the apparatus, and usually it is not provided with any means for permitting endwise adjustment. For the purposes of this invention, however, mechanism is provided for laterally moving the parts that feed and receive the sheet. In some cases the casing B is large enough to allow such adjustment, but when this is not so the casing can be enlarged to permit such movement. The lateral adjustment of the feed roller is obtained by providing the spindle E, which constitutes one of the aforesaid centers, with a screw-thread at E^1 and mounting on the spindle a sleeve E^2 that engages this thread as a nut and carries a thumb-piece E^3. The spindle E with its adjusting sleeve E^2 lies within the hollow driving spindle H and the driving spindle has an internal feather H^2 that engages a longitudinal slot E^4 in the spindle E, whereby the two spindles are compelled to rotate together but afford relative movement in an endwise direction.

The hollow spindle H has an enlarged head H^3 that receives the base of the thumb-piece E^3 wherein is a groove E^5 that is engaged by screws H^4 in the head H^3. The thumb-piece E^3 can thus be rotated relatively to the spindle H but has no endwise movement on the same.

The center D is controlled by a spring D^1 in the usual manner and merely affords a bearing for one end of the roller C. The other end of the roller enters a recess in the end of the spindle E and carries a cross-pin C^1 that engages slots E^6 formed in the head, whereby the driving movement of the spindle is communicated to the roller. These parts are of the usual construction except that the center D is made longer than usual and is permitted a greater degree of endwise travel while the spindle E, which normally has no endwise adjustment, can be adjusted by the parts already described.

As the receiving roller G in the particular case shown in the drawing, is of greater

width than the music-sheet to be wound thereon for reasons hereinafter explained, a sleeve J having flanges J^1 is provided. This sleeve rotates with the roller but is adjustable endwise thereon in order that it may be made to aline with any position in which the roller C may be set.

In the form shown in the drawings, the sleeve is made in two parts hinged together at J^2. This enables it to be placed in position on the roller G without removing the roller from the machine, and when in position the two halves are locked together by catches J^3. The roller G is provided with a longitudinal groove to receive the hinged sleeve J. This insures that the sleeve will rotate with the roller and also allow endwise adjustment of the sleeve on the roller. Conveniently that part of the roller which lies between the two hinges is left open and a scale K is mounted on the roller G while the sleeve is provided with a pointer K^1. The divisions on this scale correspond to the orifices in the tracker-board and afford means by which the sleeve can be readily set at the normal position for the music-sheet, or the required number of semi-tones up or down the scale. In the drawings the sleeve is shown as set two semi-tones down the scale, so that if the music-sheet was written in G it would be played in F. To effect this endwise adjustment of the sleeve a worm L is employed. This is conveniently disposed in the interior of the roller G and engages a lug or feather J^4 that is carried on the inner wall of the sleeve J. The roller G is slotted at G^3 to allow the feather J^4 to engage, and travel under the control of the worm L. One end of the worm L extends beyond the edge of the roller and carries a toothed wheel L^1; this engages a second toothed wheel L^2 that is carried by a thumb-piece L^3 pivoted to the end flange of the roller G. The object of the gearing that is introduced between the worm and the thumb-piece is merely to render the worm more accessible than would be the case if the thumb-piece were placed direct upon the worm.

The operation of this apparatus is as follows:—When the music is to be played in the key for which the sheet is written, the flanged sleeve J on the receiving roller G is placed so that the indicator K^1 lies opposite the zero position on the scale K and the roller C is made to aline therewith. In this position any feed roller with its music-sheet can be placed between the centers or supports D and E in the usual manner and the free end attached to the usual catch J^5 with which the sleeve J is provided and the music will always be played in the key for which the sheet is formed. If, however, it is desired to change the key, the sleeve J is moved in one direction or the other, the pointer K^1 being brought opposite the division on the scale K that denotes the number of semi-tones by which it is desired to raise or lower the piece. To move the sleeve to the position shown in the drawings, that is two semi-tones lower than normal, the thumb-piece L^3 is rotated, which rotates the worm L and thus by means of the feather J^4 slides the sleeve J endwise. The sheet A can then be attached to the hook J^5 on the sleeve J and the thumb-piece E^3 must then be rotated to move the roller C to the left until it alines properly with the sleeve J. It is not necessary, however, to use the scale K, as it is quite easy to see by means of the tracker-board how far the sheet has been displaced laterally, and the alinement of the two rollers is found in practice to be a very simple matter.

As a rule there is a considerable margin of paper beyond the highest and lowest notes indicated on the sheet, so that the sheet permits of a certain amount of adjustment without uncovering any of the orifices F^1 in the tracker-board. If, however, it is moved so far as to uncover any of these orifices, the latter may be closed by a seal M, Fig. 6. This is merely a clip of resilient material that can be sprung over the tracker-board and moved along the same until it covers the exposed apertures.

It will be seen that the device for adjusting the spindle E in no wise interferes with the driving of the roller C as the driving spindle H has direct engagement with the spindle E by means of the feather H^2 and when the apparatus is in operation the sleeve E^2 with its thumb-piece E^3 rotates as one with the spindles E and H. When adjusting the spindle E, the mechanism connected with the spindle H offers sufficient resistance to enable the sleeve H^2 to be rotated upon the screw-thread of the spindle E, the feather H^2 meanwhile operating as a fixed member.

Some of the music-sheets on the market are wider than others, and for this purpose interchangeable flanged sleeves J of corresponding width may be provided. In the particular mechanism illustrated, the receiving roller G is of sufficient width to take music of the maximum width, no lateral adjustment being allowed for as the orifices in the tracker-boards of some mechanical players are of varying width and therefore the key could not be changed by the method adopted according to this invention, but by providing a different tracker-board, as shown in the drawing, the invention can be readily applied to instruments requiring piano music.

Although the apparatus described is of the pneumatic type wherein the paper sheet

is provided with perforations that render the selected orifices in the tracker-board operative as the sheet passes over, it will be understood that the invention is equally applicable to electrical tracker-boards wherein the sheet closes the circuit between the selected electric contacts.

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

1. In a piano-player wherein the music-sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and that rotates therewith, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, means to hold the spindle against rotation when the nut is being adjusted but that permits endwise movement of the spindle during such adjustment, and means for alining the sheet as it passes from one roller to the other, substantially as described.

2. In a piano-player wherein the music sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and that rotates therewith, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, a hollow rotatable spindle that receives the screw-threaded spindle, and means to permit relative endwise movement of these parts but that compel them to rotate together, substantially as set forth.

3. In a piano-player wherein the music-sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle provided with a longitudinal channel and adapted to support one end of one of the sheet-carrying rollers and that rotates therewith, and is provided with a longitudinal channel, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, and a hollow rotatable spindle that receives the screw-threaded spindle and carries a feather which engages the longitudinal channel in the screw-threaded spindle, substantially as set forth.

4. In a piano-player wherein the music-sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and that rotates therewith, an adjusting nut on the spindle, a hollow spindle that receives the screw-threaded spindle, means to permit relative endwise movement of these parts but that compel them to rotate together, means to prevent the hollow spindle from endwise displacement relatively to the tracker board, and means for engaging the nut with the hollow spindle in such manner as to permit independent rotation of the nut and prevent displacement of the same in the axial direction of the spindle, substantially as set forth.

5. In a piano-player wherein the music-sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and that rotates therewith, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, means to hold the spindle against rotation when the nut is being adjusted but that permits endwise movement of the spindle during such adjustment, a flanged sleeve on that roller which is not adjustable endwise by the screw-threaded spindle, and means for adjusting the sleeve endwise upon its roller, for the purpose set forth.

6. In a piano-player wherein the music sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and that rotates therewith, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, means to hold the spindle against rotation when the nut is being adjusted but that permits endwise movement of the spindle during such adjustment, a flanged sleeve on that roller which is not adjustable endwise by the screw-threaded spindle, means to prevent rotation of the sleeve relatively to the roller, a worm disposed longitudinally in the roller and eccentrically to the axis thereof, and a corresponding engaging piece on the sleeve whereby rotation of the worm imparts endwise displacement to the sleeve, for the purpose set forth.

7. In a piano-player wherein the music-sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and arranged to rotate therewith, an adjusting nut on the spindle, means for holding the nut against displacement relatively to the tracker board, means to hold the spindle against rotation when the nut is being adjusted but permitting endwise movement of the spindle during such adjustment, the other roller having flanges and a longitudinal slot between the flanges, a flanged sleeve between the flanges on the second roller, a worm disposed lon-

gitudinally in the roller and eccentrically to the axis thereof one end of the worm extending beyond one of the roller flanges, and one side of the worm being exposed by the longitudinal slot in the roller, a pinion on such extension of the worm, a second pinion rotatably mounted on the flange and near the periphery of the same for engagement with the first mentioned pinion and having a milled thumb-piece whereby it can be rotated by hand, and means operating through the longitudinal slot in the roller for engaging the sleeve with the screw-thread of the worm, for the purpose set forth.

8. In a piano-player wherein the music sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a screw-threaded spindle to support one end of one of the sheet-carrying rollers and that rotates therewith, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, means to hold the spindle against rotation when the nut is being adjusted but that permits endwise movement of the spindle during such adjustment, a flanged sleeve mounted on that roller which is not adjusted endwise by the screw-threaded spindle this roller having on each end a flange and the sleeve being divided longitudinally to receive the roller, means for connecting the two portions of the sleeve together when on the roller, and a scale carried by the roller and exposed between the divided portions of the sleeve, for the purpose set forth.

9. In a piano-player wherein the music sheet carried by rollers is displaced laterally along the tracker board to change the key, the combination of a feed roller, a receiving roller, a screw-threaded spindle to support one end of the roller and rotating therewith, an adjusting nut on the spindle, means for holding the nut against axial displacement relatively to the tracker board, means to hold the spindle against rotation when the nut is being adjusted but permitting endwise movement of the spindle during such adjustment, a sleeve on the receiving roller, means for adjusting the sleeve endwise on the roller, a scale on the receiving roller indicating different positions for different keys, and a pointer fixed relatively to the sleeve whereby the degree of displacement necessary to bring the sheet into proper position for any selected key can be ascertained, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADAM TURQUAND YOUNG.

Witnesses:
R. YOUNG,
H. W. ANDREW.