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H. T. NOLTHENIUS.

APPARATUS FOR TRANSPOSING THE KEY NOTE IN PERFORMANCES OF
THE PIANOLA.

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Fig. 1

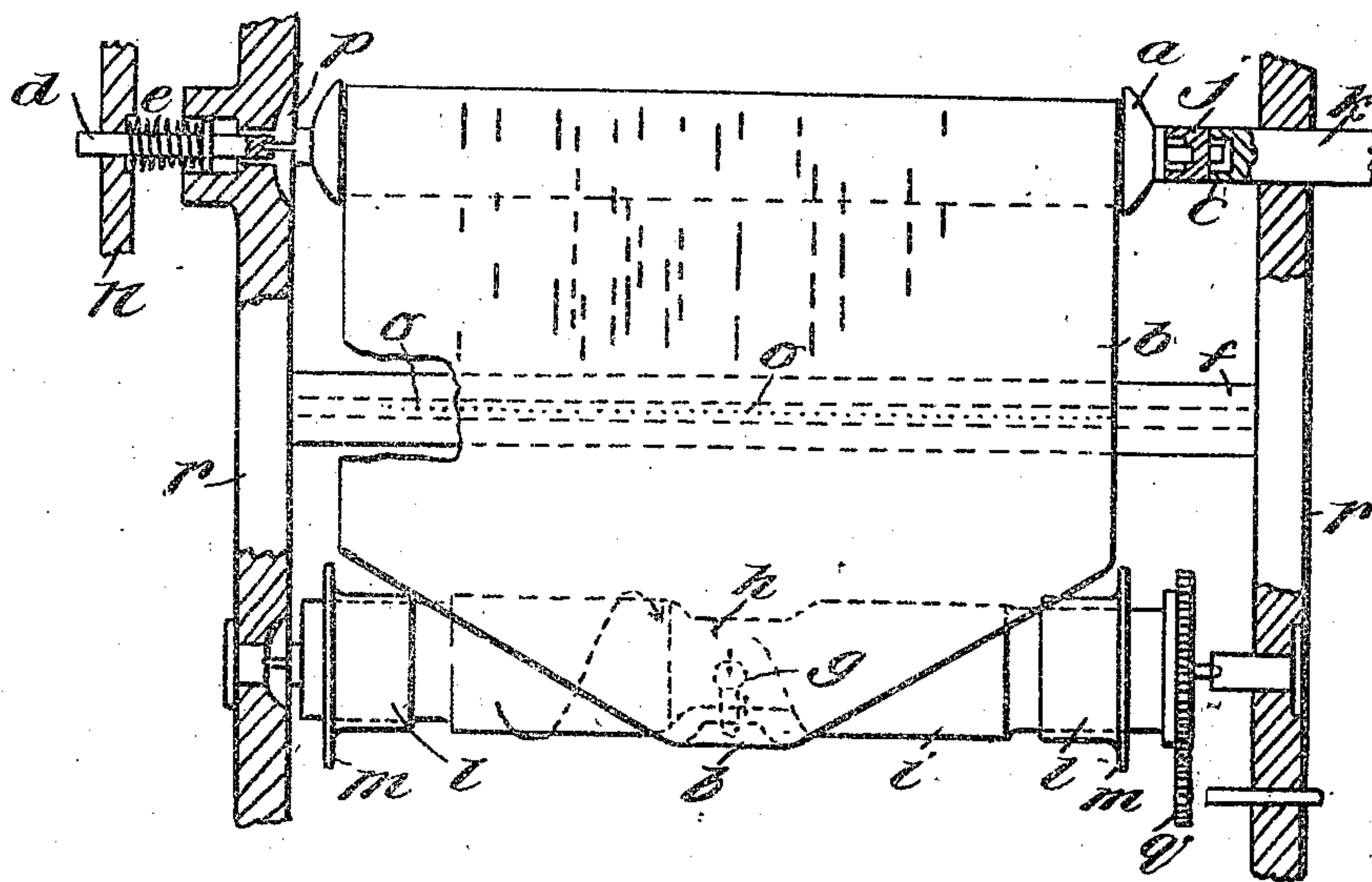


Fig. 2.

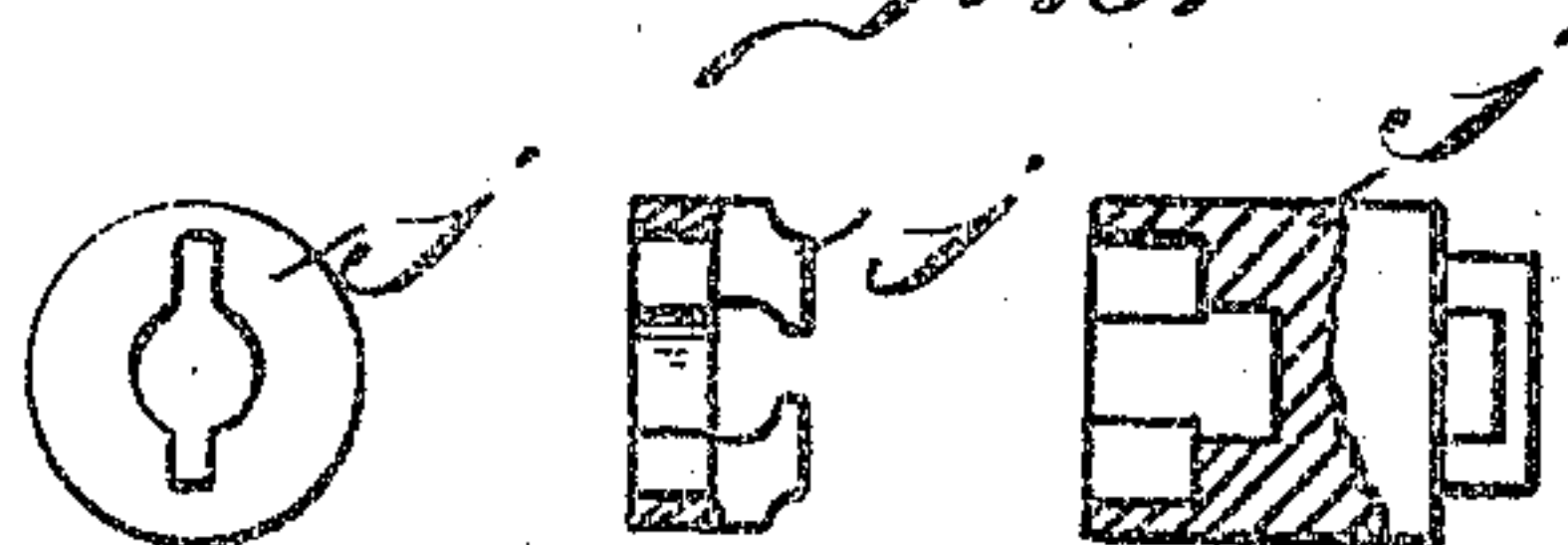
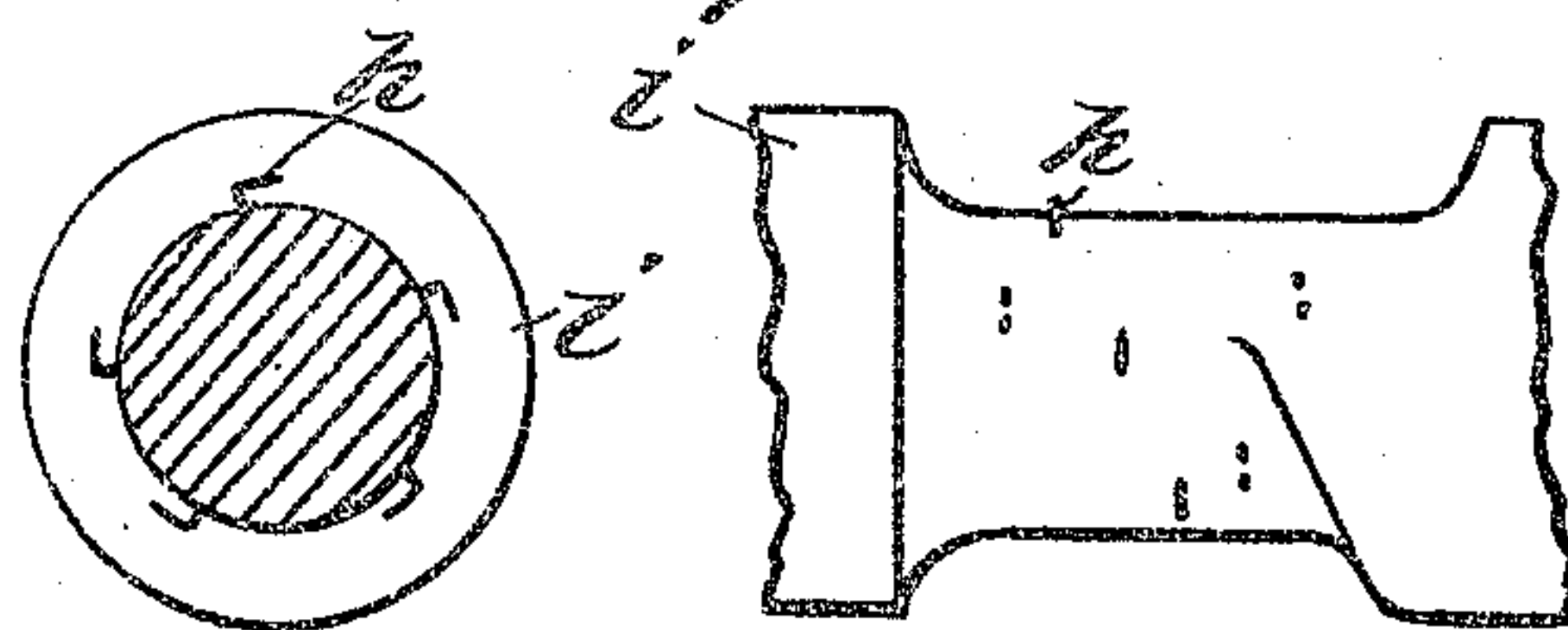


Fig. 3.



Witnesses,

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APPARATUS FOR TRANSPOSING THE KEY-NOTE IN PERFORMANCES OF THE PIANOLA.

No. 847,022.

Specification of Letters Patent.

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Application filed April 17, 1906. Serial No. 312,236.

To all whom it may concern:

Be it known that I, HUGO TUTEIN NOLTHENIUS, a subject of the Queen of the Netherlands, residing at Delft, Haagweg 117, in the Kingdom of the Netherlands, have invented certain new and useful Improvements in Apparatus for Transposing the Key-Note in the Performances of the Pianola, of which the following is a specification.

This invention relates to an apparatus for transposing or changing the key-note in which a piece of music is performed by the mechanical pianoforte-player known as the "pianola." Other instruments of this kind are already provided with means for transposing the music or changing the key-note; but heretofore this has not been the case with the pianola. The apparatus forming the subject of the present invention therefore fills a felt want.

The apparatus comprises a set of filling-up pieces adapted to be placed between one end of the roll that contains the music-paper and one of the centers between which this roll turns in order to alter the position of the music-paper laterally in regard to the instrument. As is well known, the keys of the pianoforte that the pianola actuates are represented by small suction-holes bored close together in a tracker arranged between and parallel to the roll that contains the music-paper and the roll on which the music-paper is wound up during the performance. The music-paper, a long fillet of paper perforated systematically, is tightly drawn over said tracker, closing all the suction-holes except those which correspond to the notes of the musical composition, and so these notes only are sounded on the pianoforte. Now as the pitch of the suction-holes is uniform and corresponds to a semitone it is quite clear that the moving of the paper laterally a distance equal to that between two adjacent holes has the effect of lowering or raising the key-note of the musical composition a semitone and that moving the paper twice this distance has a double effect, and so on.

The apparatus is shown in the accompanying drawing, in which—

Figure 1 illustrates in sectional elevation part of a pianola provided with my improvement. Fig. 2 shows in sectional side view and in face view two of the filling-up pieces drawn to a larger scale; and Fig. 3 illustrates a portion of the take-up roll in side view and a cross-section of said roll, showing the dif-

ferent points of attachment for the music-paper.

The roll *a*, that contains the music-paper *b*, is supported between a fixed pin *c* and a movable pin *d*, Fig. 1. The pin *c* acts as a clutch-coupling in such a way that the roll *a*, if necessary, can be turned round together with the axis *k*.

The pin *d* is slidable in the well-known manner. It may be pressed back against the pressure of the spring *e* and is guided by the support *n*.

The music-paper *b* on its way to the take-up roll *i* passes the tracker *f*. It is provided with an eye *g*, by means of which it is attached to a hook *h* on the roll *i*.

As Fig. 3 shows in the example here chosen, six hooks *h* are arranged in a helix on the roll *i*, the distance between adjacent hooks measured laterally being the same as that between adjacent holes in the tracker *f*. As the hooks *h* may not project beyond the surface of the roll *i*, a suitable recess is provided for them, Fig. 3.

Two of the filling-up pieces are illustrated in Fig. 2. They constitute lengthening-pieces to the axis *k* and are shaped as clutch-couplings. The shortest piece (illustrated in the middle of the figure) is somewhat different in shape from the other.

The take-up roll *i* is provided with two sliding bushings *l*, furnished with flanges or collars *m*, that are intended to guide the paper *b*. The parts of the framing of the instrument that support the elements here described are indicated by *r*. *g* is the tooth-gear by which the roll *i* is turned during the playing.

The filling-up pieces are used as follows: Let us suppose the accompaniment to a song is wanted to be transposed into a key-note that differs from the original by two semitones or one whole note. We choose the corresponding filling-up piece *j*, that has a length equal to twice the distance between adjacent suction-holes *o*, and putting the roll *a* with the music-paper *b* into the instrument we bring this piece *j* between the roll *a* and the pin *c*, Fig. 1, at the same time pushing back the spring-supported pin *d* and compressing the spring *e* as much as necessary. The paper is then attached to the take-up roll *i* by putting the eye *g* on the hook *h* that corresponds to the center line of the music-paper, and the sliding bushings *l* are moved till the employed hook *h* is in the middle be-

tween the collars *m*. The distance between the collars *m* must correspond to the width of the paper *b*. The effect of this manipulation is that the paper *b* is moved laterally with respect to the tracker *f* a distance corresponding to the length of the piece *j*, in the case supposed to twice the distance between adjacent suction-holes *o*. Therefore any hole in the paper that represents a definite note does not pass the suction-hole *o* in the tracker *f* corresponding to this note, but the second next hole, that represents a note differing by two half-notes from it. The key-note of the musical composition is thus altered as required. The performance finished, it is necessary to bring the music-paper from the roll *i* back on the roll *a*. This is executed in the usual manner by disconnecting the gear *g* and turning the axis *k* backward. The piece *j* that is shaped to connect the axis *k* to the roll *a* permits this motion.

A set of five filling-up pieces *j* will do very well for general use, this being sufficient to transpose from tenor to bass.

The apparatus forming the subject of the present invention may be applied to the pianola without alterations or cost worth mentioning. A pin *d* of sufficient length, if necessary a recess *p* in the side wall *r*, to permit the full movement of the roll *a* and the removing from the left-hand side of the roll *i* of a collar that would not permit a sufficient movement of the left sliding bush *l* are the only points in which the instrument as previously made may require to be altered.

Having thus described my invention, I declare that what I claim is—

1. The combination with a perforated music-sheet, a tracker, and a pair of rolls for said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having means for correspondingly attaching the music-sheet.

2. The combination with a perforated music-sheet, a tracker, and a pair of rolls for said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having a plurality of devices for correspondingly attaching said music-sheet.

3. The combination with a perforated music-sheet, a tracker, and a pair of rolls for

said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having a pair of flanged slidable bushings for guiding said music-sheet and a plurality of attaching devices corresponding to the filling-up pieces.

4. The combination with a perforated music-sheet, a tracker, and a pair of rolls for said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having a plurality of longitudinally-spaced attaching devices corresponding to the filling-up pieces.

5. The combination with a perforated music-sheet, a tracker, and a pair of rolls for said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having an annular recess and a plurality of longitudinally-spaced attaching devices in said recess.

6. The combination with a perforated music-sheet, a tracker, and a pair of rolls for said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having adjustable guiding means, an annular recess, and a plurality of longitudinally-spaced attaching devices.

7. The combination with a perforated music-sheet, a tracker, and a pair of rolls for said music-sheet, of a plurality of filling-up pieces of varying lengths and corresponding to the different keys and adapted to be introduced singly between one end of the winding-roll and the bearing-axis of said roll, the other roll having a plurality of attaching devices, the said filling-up pieces and attaching devices corresponding to each other and to the different keys.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HUGO TUTEIN NOLTHENIUS.

Witnesses:

ANTONIE ELLETT'S DOCEN,
AUGUST SIEGFRIED DOCEN.