

(No Model.)

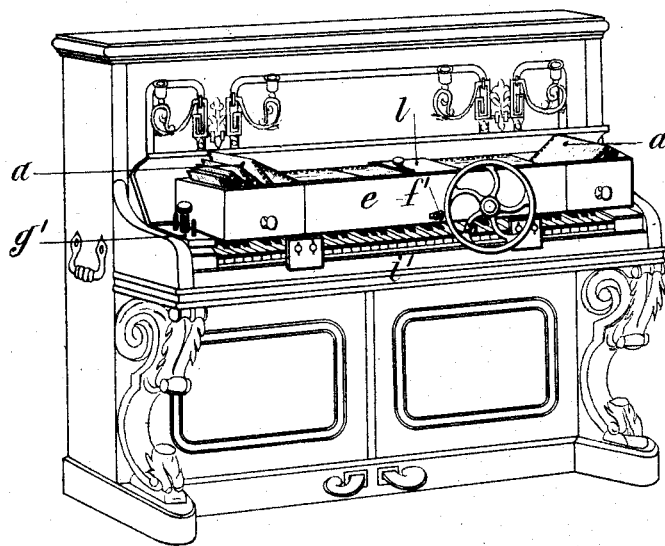
7 Sheets—Sheet 1.

G. P. LE DAN.
MECHANICAL KEY BOARD PLAYER.

No. 419,690.

Patented Jan. 21, 1890.

FIG. 1.



Witnesses:

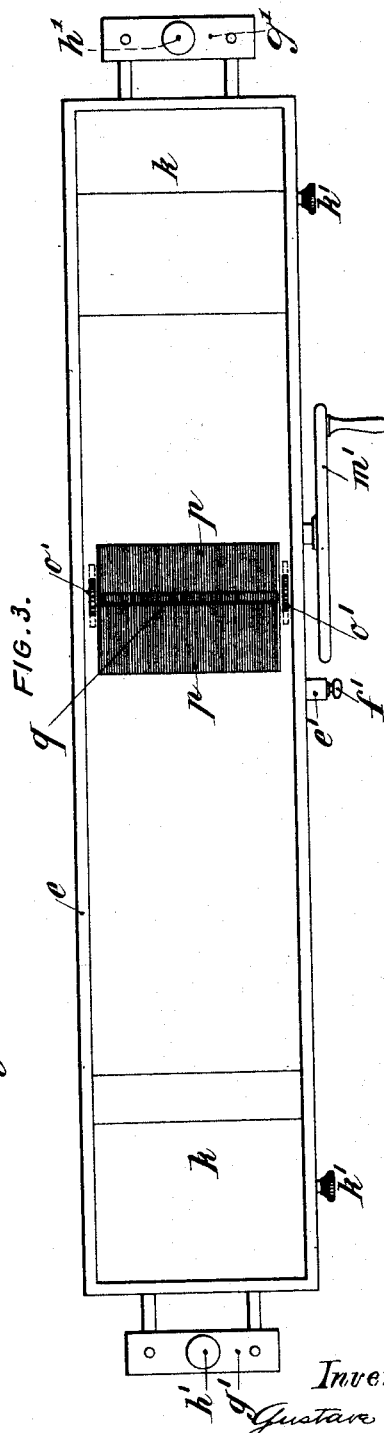
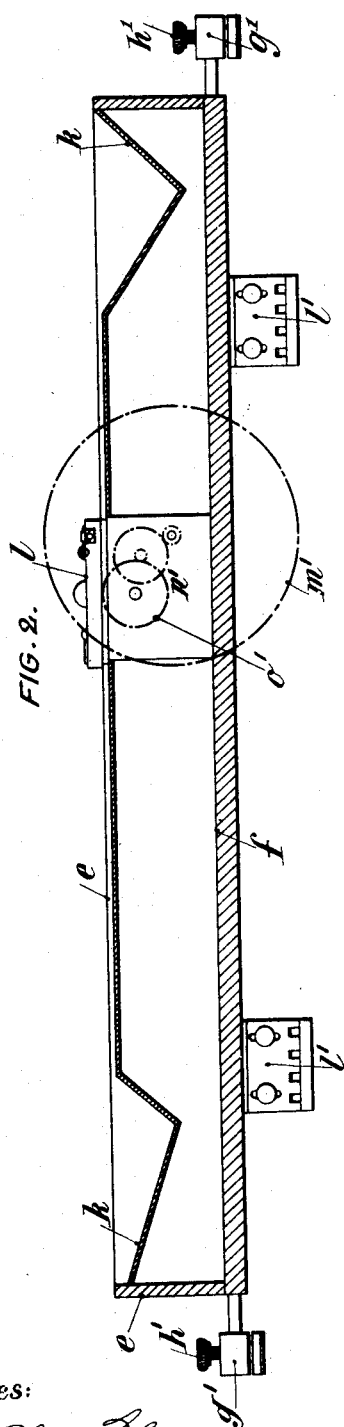
John M. Speer.
Theo. F. Bourne.

Inventor
Gustave P. Le Dan.
by Briesen, Steele & Knaut
his Attorneys.

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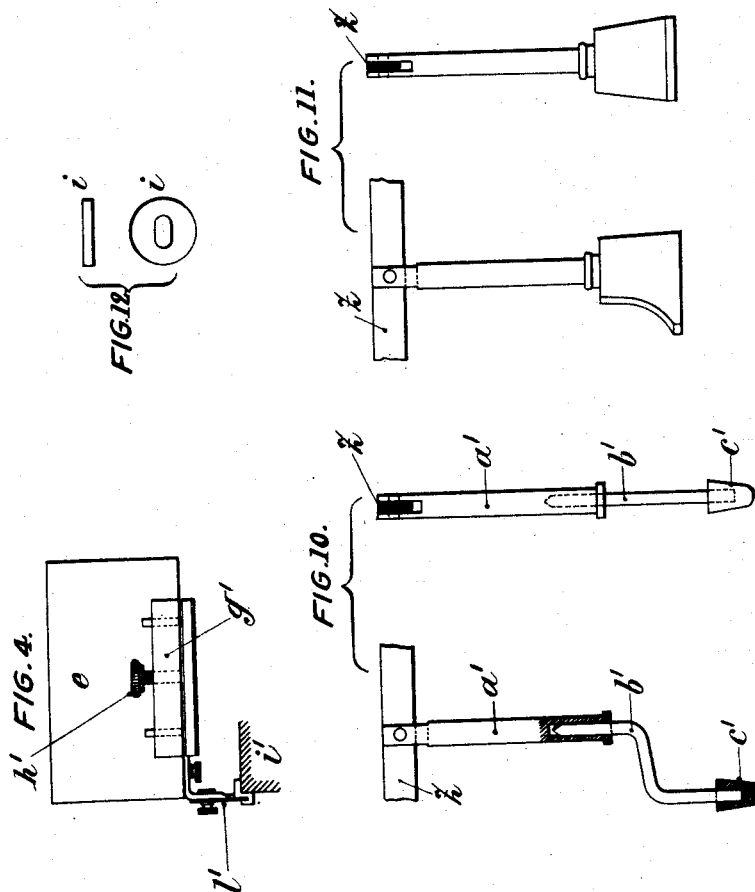
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Witnesses:

John M. Spear.
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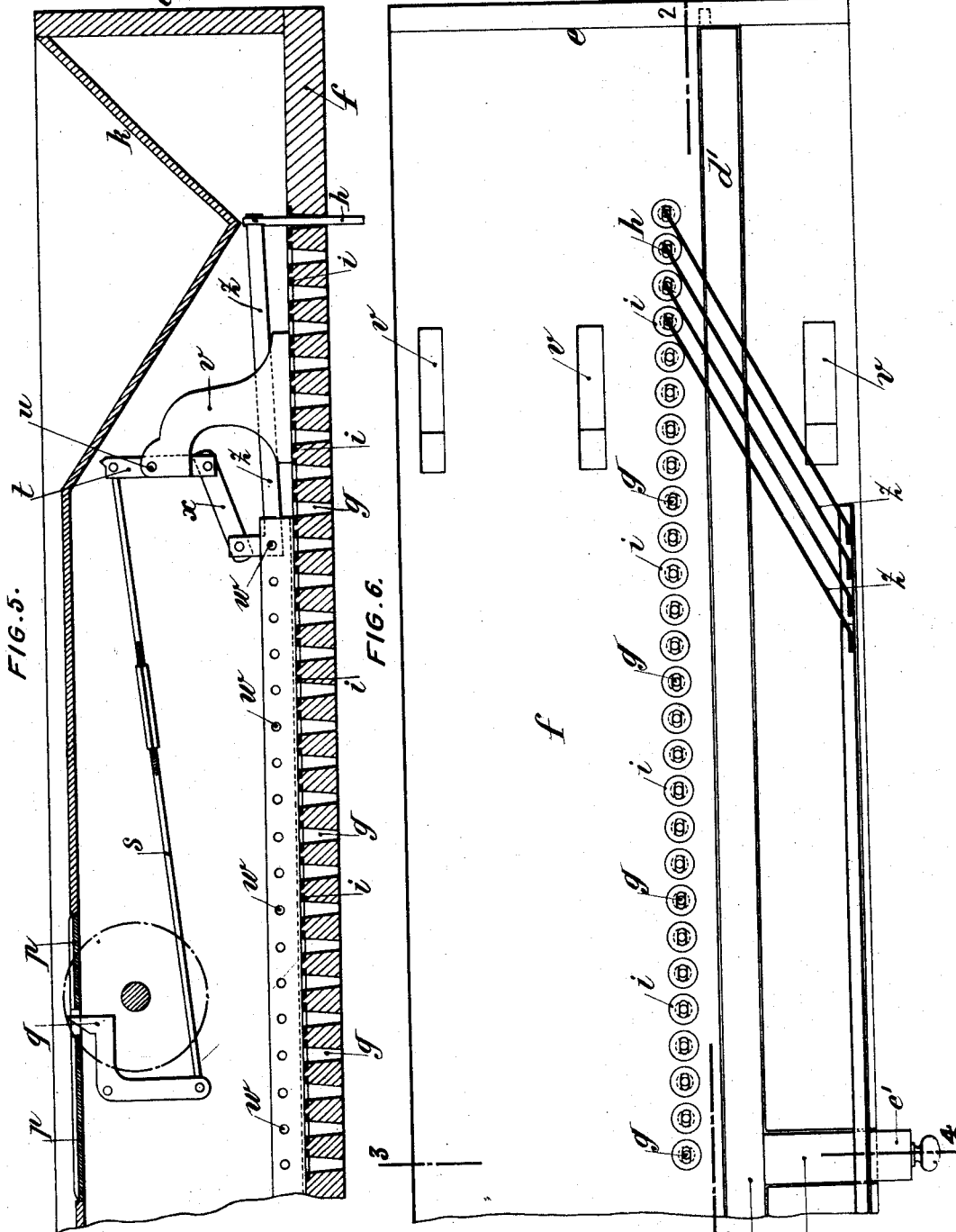
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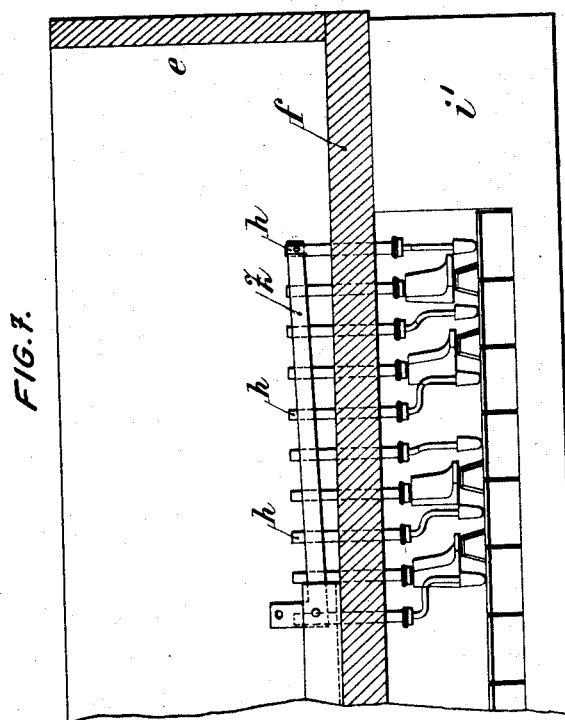
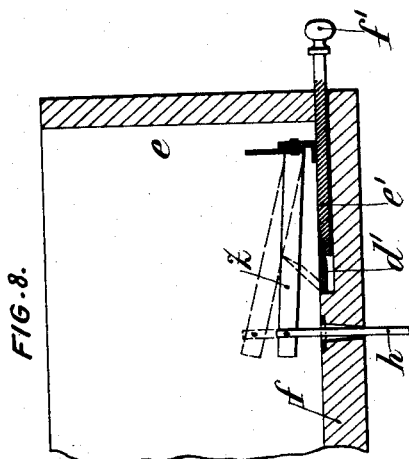
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Witnesses:

John M. Spear.

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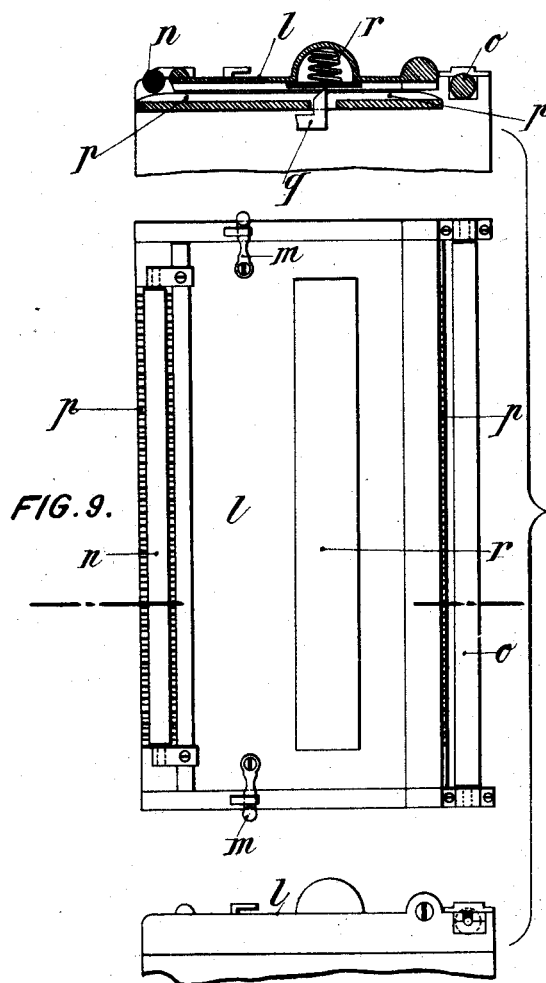
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Witnesses:

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Thos. F. Bourne.

Inventor:

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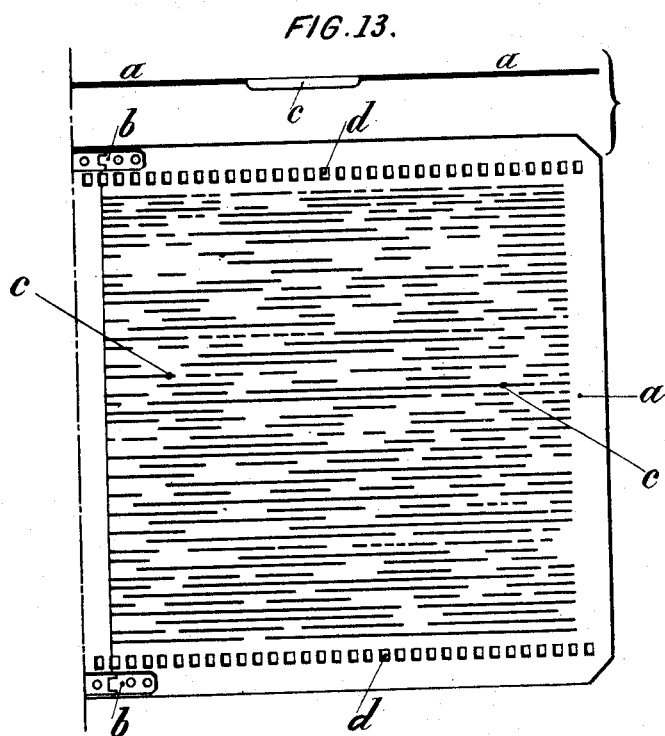
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Patented Jan. 21, 1890.



Witnesses:

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UNITED STATES PATENT OFFICE.

GUSTAVE PAUL LE DAN, OF PARIS, FRANCE.

MECHANICAL KEY-BOARD PLAYER.

SPECIFICATION forming part of Letters Patent No. 419,690, dated January 21, 1890.

Application filed January 9, 1889. Serial No. 295,845. (No model.) Patented in France September 27, 1887, No. 186,094; in Belgium September 28, 1887, No. 79,024, and in England October 4, 1887, No. 13,424.

To all whom it may concern:

Be it known that I, GUSTAVE PAUL LE DAN, of the city of Paris, France, have invented Improved Apparatus for Playing Mechanically upon the Piano or other Key-Board Musical Instrument, (for which I have obtained Letters Patent in France for fifteen years, dated September 27, 1887, No. 186,094; in Belgium for fifteen years, dated September 28, 1887, No. 79,024, and in England for fourteen years, dated October 4, 1887, No. 13,424,) of which the following is a full, clear, and exact description.

My invention relates to an apparatus for playing mechanically upon the piano or other key-board musical instrument; and it consists, essentially, in mechanism whereby the keys are depressed in proper order by tracker-pins carried by levers actuated directly by the passage of the cards representing the piece to be played.

The invention also consists in the means of adapting the apparatus to different key-boards, as hereinafter described.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 represents a perspective view of a piano-forte with the mechanical player applied in position thereon. Figs. 2, 3, and 4 show, respectively, a longitudinal vertical section, top plan, and end view of the box containing the apparatus, with its means of adjustment. Figs. 5 and 6 show in vertical section and plan, on a larger scale, details of the mechanism of the operating-levers. Fig. 7 is a longitudinal vertical section on line 1 2, and Fig. 8 is a cross-section on line 3 4, of Fig. 6. Fig. 9 shows details of the pressure-plate, beneath which are passed the cards used for playing the piece. Fig. 10 shows full-size views of one of the tracker-pins for acting on the white keys, and Fig. 11 similar views of those for acting on the black keys. Fig. 12 shows one of the washers for bushing the guides for the tracker-pins. Fig. 13 shows one of the music-cards used in this apparatus.

The same letters of reference indicate like parts in all the figures.

The music-cards *a*, Fig. 13, which are connected together by hinges *b*, are made of steel

plates stamped up or embossed in such manner as to form projections *c* of a length depending on the value of the notes they represent, as shown in Fig. 13. The cards are also provided at either side with a row of perforations *d*, forming a rack in which gear the teeth of the wheels by which the cards are moved along.

The operative mechanism, hereinafter described, is contained in a box *e*, Figs. 1, 2, and 3, having a row of holes *g* in the bottom *f*, Figs. 5 and 6, corresponding in number to the notes or levers. These holes, through which pass the tracker-pins *h*, as shown in Fig. 5, are of conical form, to permit of the oscillation of the tracker-pins consequent on the angular movement of the levers, and they are bushed with washers *i*, of felt, leather, or india-rubber, (separately represented in Fig. 12,) inserted in the larger ends of the holes *g*, and having an oblong hole to admit of the oscillation of the tracker-pins. The top of the box forms a guiding and supporting table for the chain of cards, and has a V-shaped cavity *k* at each end, in which the cards are folded, as shown in Fig. 1, before and after operation. The cards in action pass beneath a pressure-plate *l*, Fig. 9, by which they are held down upon a fluted surface *p*, Fig. 3, the plate being hinged and secured by latches *m*. The flutes of the part *p* correspond to the rows of projections *c* on the cards. Elastic guide-rollers *n o* are mounted at front and rear of the plate *l*. The beveled ends of the levers *q* project up through a transverse slot in the fluted surface *p*, and immediately above them the plate *l* carries a spring-presser *r*, by which the projections *c* of the cards *a* are caused to press upon and oscillate the levers, and which respectively correspond to the notes to be played.

Each key is acted on through the following parts: first, the elbow-lever *q*; second, a rod *s*, made in two parts connected by an adjusting screw-coupling; third, a lever *t*, pivoted on a center *u*, carried by brackets *v*, and, fourth, a link *x*, connecting lever *t* to an elbow-lever *z*, pivoted at *w*, and to the long arm of which is jointed the tracker-pin *h*. When a projection *c* of the card *a* bears upon the corresponding lever *q*, the corresponding key will

be depressed at the moment and for the time prescribed by the rhythm of the music. As the pins *h* are in a line side by side, they are of different forms, as shown in Figs. 10 and 11, according as they are to act upon the white or black notes of the key-board. For the former the pin has its lower part *b'* cranked and received in the socketed end of *a'*, so that it may be turned about a vertical axis until its elastic head *c'* corresponds exactly with the key, (see Fig. 10,) while for the latter the pin is shorter and has a foot of sufficient breadth to reach the raised black key. (See Fig. 11.)

To place the apparatus on the key-board, the tracker-pins *h* are raised by means of a longitudinal pivoted bar *d'*, Figs. 6 and 8, passing beneath the lever *z* and turned up, as shown in dotted lines in Fig. 8, by a pusher-knob *f'*, having an incline *e'*, that comes beneath the beveled side of the bar *d'*. The case is then placed over the key-board with the end bracket-supports *g'* resting upon blocks at each end of the key-board, as shown in Fig. 1, said supports having a sliding adjustment to suit key-boards of different lengths and being fixed in position by set-screws *k'*. *h' h'* are beveling-screws. A pair of brackets *l'*, Figs. 2 and 4, terminating in an L-shaped or re-entering foot, rests upon the edge of the part *i'* of the case, both the vertical and horizontal members of the brackets being capable of adjustment in the direction of their length. After the apparatus has been adjusted in position the foot-bar *d'* is turned down out of the way of the lever *z*.

The mechanism is operated by a hand-wheel *m'*, geared through a train of wheels *n'* with wheels *o'*, whose teeth engage in the perforations *d* of the cards; or it may be

automatically operated by means of clock-work or other motor.

I claim—

1. In an apparatus for playing mechanically upon the piano or other key-board instrument, a card having projections, combined with an elastic presser *r* and with mechanism, substantially as described, for connecting the card with vibratory and reciprocating tracker-pins *h*, passing through conical holes *g* in the partition *f*, and with said tracker-pins and the keys of the instrument, substantially as specified.

2. In an apparatus for playing mechanically upon the piano or other key-board musical instrument, the herein-described means of adjusting the apparatus upon the key-board, consisting in the combination of the lifting-bar *d'*, for raising the tracker-pins *h*, adjustable supports *g'*, resting upon the end framing of the instrument, and brackets *l'*, resting upon the front of the framing and adjustable in either direction, as hereinbefore described, and illustrated in the drawings.

3. In an apparatus for playing mechanically upon the piano or other key-board musical instrument, the tracker-pins made in two parts, the one part *b'*, carrying the head *c'*, being cranked and fitted in a socket in the part *a'*, so as to be capable of adjustment, as hereinbefore described, and illustrated in Fig. 10.

The foregoing specification of my improved apparatus for playing mechanically upon the piano or other key-board musical instrument signed by me this 11th day of December, 1888.

GUSTAVE PAUL LE DAN.

Witnesses:

R. J. PRESTON,
ALBERT MOREAU.