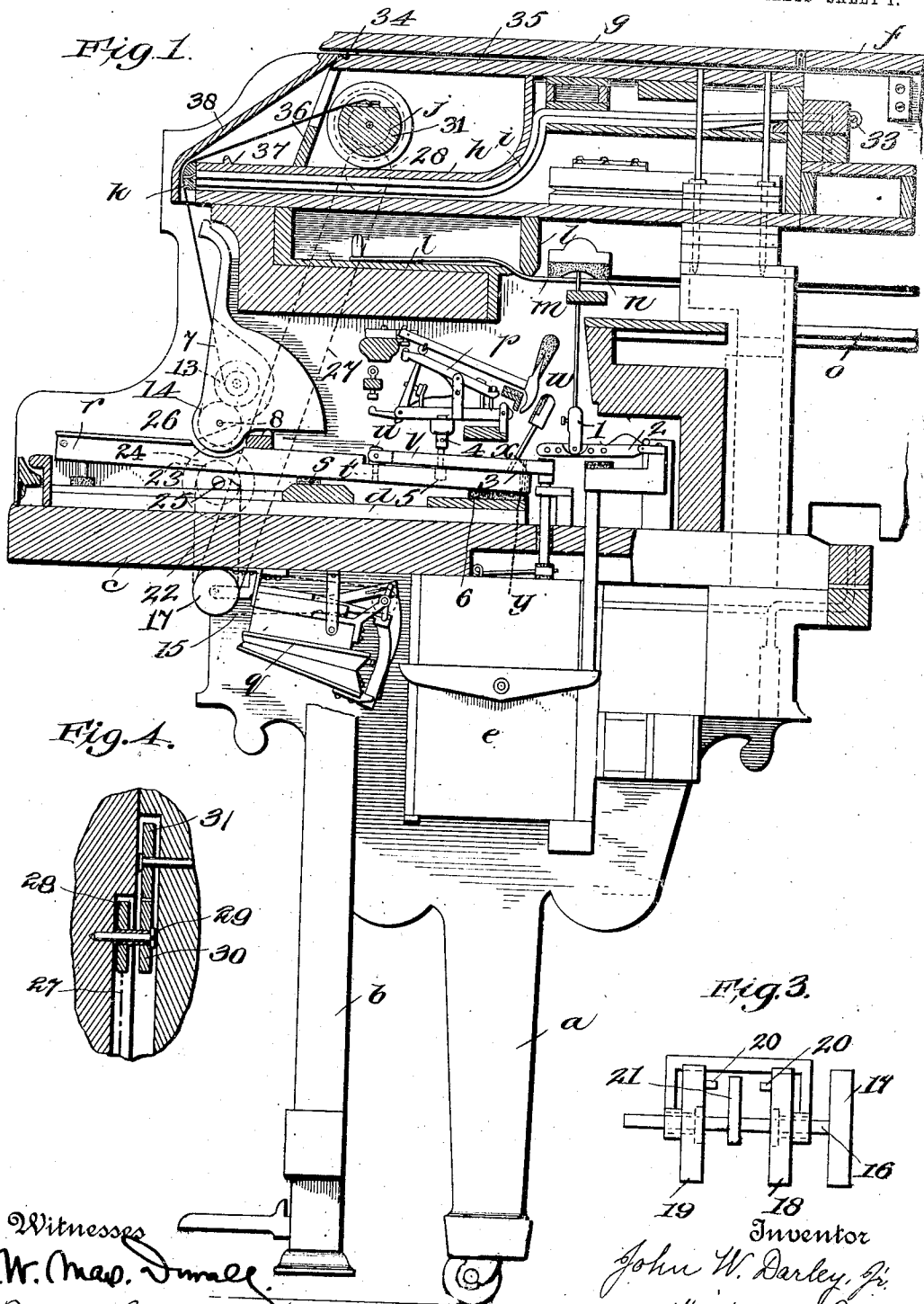


901,890.

J. W. DARLEY, JR.
AUTOMATIC GRAND PIANO.
APPLICATION FILED NOV. 3, 1906.

Patented Oct. 20, 1908.
2 SHEETS—SHEET 1.



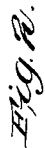
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Fig. 3.
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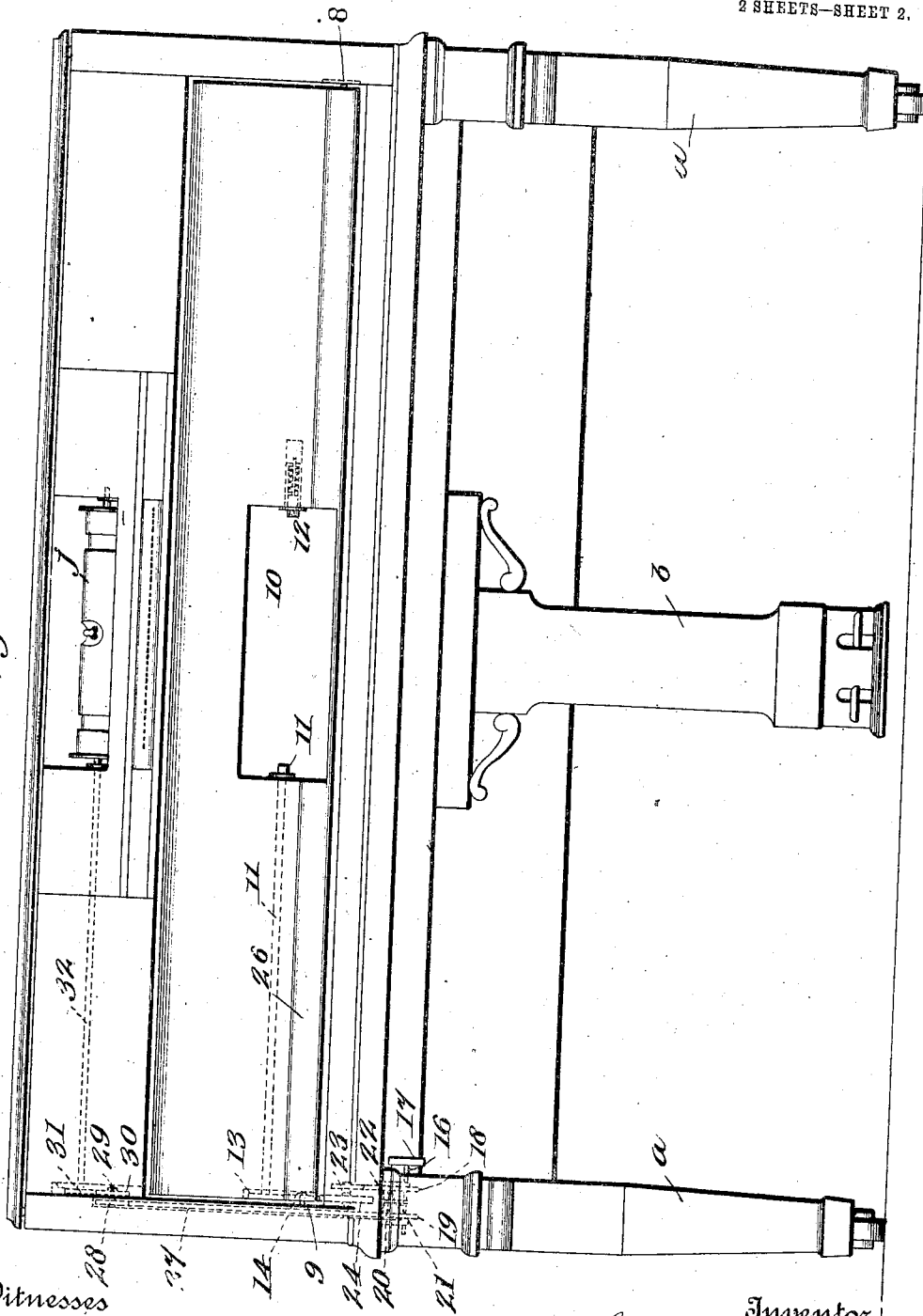


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UNITED STATES PATENT OFFICE.

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OF BALTIMORE, MARYLAND.

AUTOMATIC GRAND PIANO.

No. 901,890.

Specification of Letters Patent.

Patented Oct. 20, 1908.

Application filed November 3, 1906. Serial No. 341,891.

To all whom it may concern:

Be it known that I, JOHN W. DARLEY, JR., a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Automatic Grand Pianos; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in automatic grand pianos, and the object of my invention is to produce a piano of this class in which the keys may be operated either by hand or by pneumatic means, in which the front of the keys will not be moved by the operation of the pneumatic means and in which the keys are never locked, but can always be played by hand, so that a duet can be played with the roll music and by hand at the same time, and so that the keys will remain stationary during the operation of the pneumatic means.

Furthermore, the object of the invention is to provide means whereby the music roll may be mounted in the fall board, and the winding roll and tracker board mounted in a hinged box located above the front portion of the string frame.

With these objects in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings Figure 1 is a cross section of the front of a grand piano, showing my invention applied thereto, parts being shown in elevation and certain parts being omitted, as they are either well known in the art or else covered by prior applications; Fig. 2 is a front view of the same showing the fall board folded back and the music rest removed, the motor shown in Fig. 1 being omitted in this figure; Fig. 3 is a fragmentary view of the part of the gearing between the motor and the winding rolls.

a represents the supporting legs, *b* the lyre, *c* the key bottom, *d* the key frame, *e* the pneumatic box, *f* and *g* the hinged folding lid, *h* a wooden partition covering the tracker pipes, *i*, *j* the winding roll, *k* the tracker board, *l* the string frame, *m* the strings, *n* the dampers, *o* the sounding board, *p* the main part of the action, and *q* the mo-

tor, all of these parts being of the usual or well known construction.

r represents one of the keys pivoted at *s* in the usual manner to the key frame. The rear part of each of the keys *r* is cut away as shown in Fig. 1, and in the cut away portion is mounted a pin *t*, which is provided with an enlarged head *u*, to which is pivoted the forked end of a lever *v*, which carries the usual back check *w*. The lever *v* is provided near its rear end with a pin *x*, shown in dotted lines in Fig. 1; which pin works in a cloth-lined slot *y* in the main part of the rear end of the key *r* thereby guiding the movement of the lever *v*. This lever *v* is arranged to lift the dampers *n* by means of the connections 1 and 2, in the usual way, whether it is operated by the key *r* or by the pneumatic means. Preferably a pad, such as 3, is interposed between the main part of the key *r* and the lever *v*. This lever is, therefore, carried bodily by the key, the pad 3 limiting its downward movement while it is free to move upward, as it is pivoted to the head *u* of the pin *t*.

Mounted in the lever *v* between the fulcrum and the pad is the capstan screw 4, which can be screwed up and down in the usual way, a recess 5 being provided in the main body of the key *r* to provide a clearance for the downwardly projecting end of the capstan screw. This capstan screw is adapted to lift the lower part of the piano action *p* whenever the lever *v* is lifted.

It is obvious from the construction described that a blow on the front part of the key *r* will lift the lever *v* thereby lifting the damper *n* and the piano action *p*, causing the hammer to strike against the strings. It is also obvious that if the lever *v* is lifted by pneumatic means, the front part of the key *r* will be unaffected, but the damper will be lifted and the string struck by the hammer of the piano action. The levers *v* are operated by pneumatic means from the pneumatic box *e* in the usual way. Furthermore, the levers *v* being pivoted at their front ends and having capstan screws in the rear of said pivots, there is always a downward pressure upon said levers *v* thus keeping them constantly in connection with the pneumatic means, and having a tendency to press said levers against their bearings in the heads *u* and thus keep the rear ends of

said keys always down against the cushions 6. Thus it will be seen that the keys *r* are never locked, hence they can always be played by hand. It will also be seen that the levers *v* can be operated independently of the keys by the pneumatic means, or by the keys themselves when they are struck by the performer. Thus it is possible either to use the keys in the ordinary way or to use the piano to play roll music, or a player can use the roll music and play a duet therewith on the keys. The keys *r* are never operated by the pneumatic means, which is a desirable feature in pianos of this construction.

7 represents the fall board, which is made larger than usual near its lower end, and is provided with the usual pivots 8 and 9 about which it rotates. This fall board is cut away as shown at 10, in Fig. 2, and in dotted lines in Fig. 1, for the reception of the music roll.

11 represents a shaft on the projecting end of which one end of the music roll is supported, said shaft being provided with a cut-away portion in which the winged end of the music roll pivot bearing is received in the usual way.

12 represents a spring pressed socket for the reception of the pivot bearing on the other end of the music roll, which parts operate in the usual manner.

The shaft 11 extends through a hole provided in the fall board nearly to the left hand side of the piano, and on the end of said shaft is provided a spur wheel 13, shown in dotted lines in Figs. 1 and 2. This spur wheel meshes with a similar spur wheel 14 mounted on the pivot 9.

The motor *g* by means of a sprocket chain 15 drives the shaft 16 by means of a pulley 17 thereon. Shaft 16 is mounted in brackets depending from the key bottom, and this shaft is arranged not only to rotate in said brackets, but also so that it can be shifted longitudinally therein. Loosely mounted on flanged sleeves surrounding the shaft 16 are the sprocket wheels 18 and 19, which wheels are used to drive the music roll and winding roll. Each of these wheels 18 and 19 has a projection, such as 20, on its inside face, and the shaft 16 is provided with a projecting pin 21 adapted to engage either one of said pins on the wheels 18 and 19 according as the shaft is shifted to the right or to the left.

From the sprocket wheel 18 runs a sprocket chain 22, which passes over the sprocket wheel 23. Parallel to the sprocket wheel 23 is a large gear wheel 24. The wheels 23 and 24 are rigidly mounted on a sleeve which is revolvably supported on a screw stud 25 secured in the frame of the piano. The gear wheel 24 is arranged to mesh with the gear wheel 14 carried by the

fall board. Hence it is evident, since the wheel 14 is concentric with the pivot of the fall board, that this fall board may be raised and lowered without disturbing the gear connection. The fall board is extended outwards forming a bulb, as shown at 26, the left hand end of which forms a shield for the gear wheel 14, the keys *r* being cut away, as shown in Fig. 1, to provide space for said bulb-like extension.

From the sprocket wheel 19 runs a sprocket chain 27, which gears with a sprocket wheel 28. Parallel to the sprocket wheel 28 is a gear wheel 30, both being rigidly secured on a sleeve supported on the screw stud 29, which is secured in the piano frame. Gear wheel 30 meshes with a gear wheel 31 on the shaft 32 of the winding roll *j*, which is mounted in a box hinged as shown at 33 to the sides of the piano. This box, therefore, may be folded back in order to obtain access to the strings *m* to tune them, the gear wheels 30 and 31 simply separating during this folding back action, and meeting when the box is folded forward into the position shown in Fig. 1.

k represents the tracker board over which the sheet of music passes from the music roll to the winding roll. The tracker board is ordinarily concealed by a cover 38 hinged at 34 to the top of the box 35, and when this is folded upward it comes in line with the partition 36 forming a music rest, a ledge 37 serving to support the lower end of the sheet of music.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is—

1. In an automatic grand piano, the combination of strings, tuning pins for said strings, a fall board, a music roll mounted in bearings in said fall board, and a tracker normally fixed in position and overlying said tuning pins, but movable from said position to permit access to said pins, substantially as described.

2. In an automatic grand piano, the combination of strings, tuning pins for said strings, a fall board, a music roll mounted in bearings in said fall board and a tracker board overlying said tuning pins and movable independently of said music roll upwardly and rearwardly to permit access to said tuning pins, substantially as described.

3. In an automatic grand piano, the combination of a fall board provided with bearings, one of which is spring pressed, and a tracker board pivotally movable independently of said bearings into and out of operative position, substantially as described.

4. In an automatic grand piano, the combination of keys, strings, tuning pins for said strings, a fall board adapted to be folded down over the keys, said fall board having a recessed portion, bearings in said

recessed portion, one of which is spring pressed, and a tracker board located above said tuning pins but movable independently of said bearings upwardly and rearwardly to permit access to said tuning pins, substantially as described.

5. In an automatic grand piano, the combination of a pivoted fall board provided with a recess, bearings projecting into said recess, one of which is spring pressed, a music roll mounted in said bearings, and means carried by said fall board for positively driving said music roll, substantially as described.

6. In an automatic grand piano, the combination of a fall board provided with a recess, bearings projecting into said recess, a music roll mounted in said bearings, and means carried by said fall board for driving said music roll, substantially as described.

7. In an automatic grand piano, the combination of strings, tuning pins for said strings, a fall board provided with a recess, a music roll supported therein and a tracker board and winding roll overlying said tuning pins and movable to permit access to said tuning pins, substantially as described.

8. In an automatic grand piano, the combination of strings, tuning pins for said strings, a tracker board located above said tuning pins, a music roll, a winding roll located in a plane higher than said tracker board, and means for moving said tracker board and winding roll upwardly and rearwardly independently of said music roll to permit access to said tuning pins, substantially as described.

9. In an automatic grand piano, the combination of a pivoted fall board provided with a recess, bearings projecting into said recess, a music roll mounted on said bearings, and gearing for driving said music

roll, the whole being so arranged that the fall board may be folded down over the keys or moved up to expose them without disturbing said gearing, substantially as described.

10. In an automatic grand piano, the combination of strings, tuning pins for said strings, a music roll supported in suitable bearings, a tracker board located in a higher plane than said music roll, a winding roll located in a higher plane than said tracker board, said tracker board and winding roll overlying said tuning pins and being movable independently of said music roll to permit access to said tuning pins, and gearing for driving said winding roll, said gearing being arranged so as to automatically become disengaged when the tracker board and winding roll are moved upwardly and rearwardly, substantially as described.

11. In an automatic grand piano, the combination of strings, tuning pins for said strings, a fall board provided with a recess, a music roll mounted in bearings in said recess, a tracker board located in a higher plane than said music roll, a winding roll mounted in a higher plane than said tracker board, and transmitting devices for driving said music roll and said winding roll, said transmitting devices being so arranged that the tracker board may be folded down or up, the winding roll and tracker board overlying said tuning pins and foldable upwardly and rearwardly without the necessity of manually disengaging any of the transmitting devices, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. DARLEY, JR.

Witnesses:

MYRON G. CLEAR,
PERCY H. MOORE.