

(No Model.)

F. ALLASIA.
MUSICAL INSTRUMENT.

No. 462,963.

Patented Nov. 10, 1891.

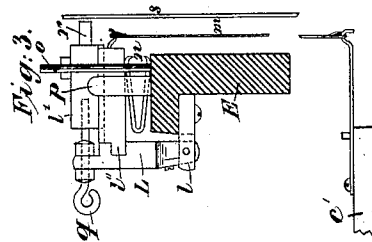
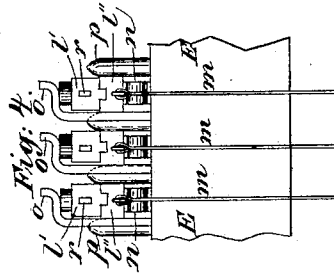
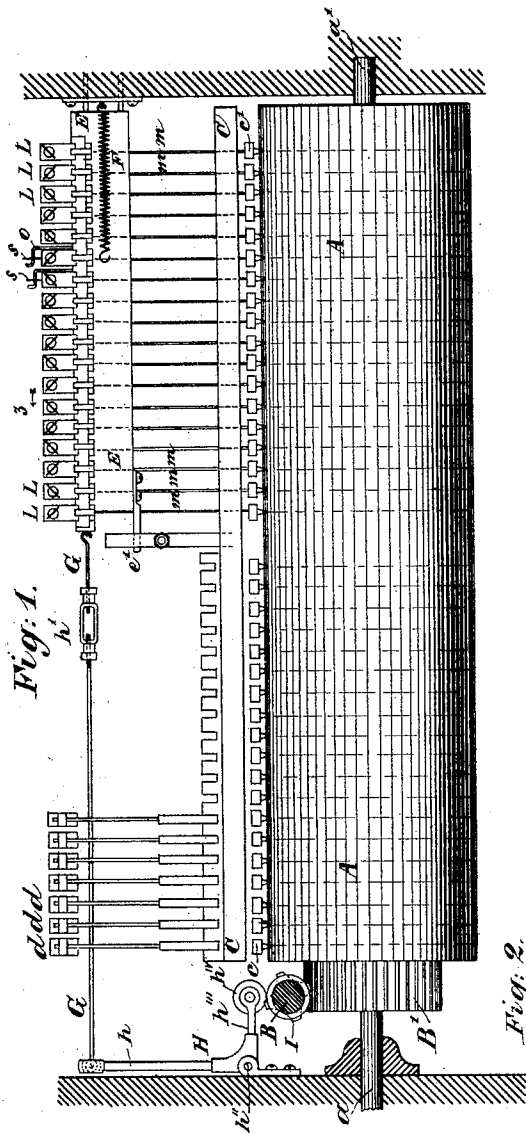
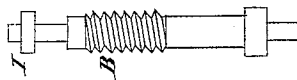


Fig. 2.



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UNITED STATES PATENT OFFICE.

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MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 462,963, dated November 10, 1891.

Application filed May 7, 1891. Serial No. 391,957. (No model.)

To all whom it may concern:

Be it known that I, FRANCESCO ALLASIA, a subject of the King of Italy, and a resident of Turin, Italy, have invented certain Improvements in Musical Instruments, of which the following is a specification.

My invention relates to the class of mechanical musical instruments such as barrel-organs, mechanical pianos, music-boxes, and the like; indeed, to all of that class of instruments where the notes in playing are controlled or produced by pins or studs in a rotating barrel or other moving part or by holes in a moving card, &c.

The object of the invention is to combine with the instrument adapted for playing an air—a mechanical piano, by preference—a mechanism for striking a set of strings in the manner that a mandolin is played by hand, thus producing mandolin tones.

The invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the accompanying drawings, serving to illustrate the invention, Figure 1 is an elevation of the principal part of an instrument embodying my improvements. Fig. 2 shows the motor-shaft detached. Fig. 3 is a sectional side elevation on a scale double that of Fig. 1. The plane in which the section is taken is indicated by line 3 3 in Fig. 1. Fig. 4 is a view as seen from arrow *z* in Fig. 3.

A (see Fig. 1) is a cylinder constructed in a manner analogous to that of the ordinary mechanical piano, and *a a* are its journals, which find bearings in the frame of the instrument.

B is the endless screw-arbor which drives the cylinder A through the medium of the worm-wheel B' on the latter. In a bar C over the cylinder are mounted levers *c* and *c'*, which are acted upon by studs set in the cylinder A in the usual manner when the latter rotates. A portion of these levers may be arranged to produce the usual sounds or tones of a piano, and in Fig. 1 I have shown some of these *c* at the left, where they command and actuate hammers *d* in the same manner as in the ordinary mechanical piano. Therefore no further description of this part of the instrument will be required.

The portion of the mechanism seen at the

right in Fig. 1 is designed to produce the mandolin tones or effects.

A bar E is arranged to reciprocate longitudinally to a limited extent on its bearing-pins *e e'*. This bar is adapted to move in one direction toward the right, as seen in Fig. 1, by a spring F, and to be moved in the opposite direction by a mechanism comprising a cam I on the arbor B, an elbow-lever H, pivoted at *h''*, one arm *h'''* of which lever carries a roller *h^t*, which rests on said cam, and the other arm *h* of which is connected to bar E by a wire or rod G, which may have in it a turn-buckle *h'* for longitudinal adjustment. The effect of this construction is to impart to the bar E a rapid endwise reciprocating movement when the shaft B rotates. The cam I will be four-sided by preference, but it may have some other form.

Referring now to Figs. 3 and 4 especially, pivoted at *l* on the bar E is a piece L, somewhat in the form of an inverted letter L. The branch *l''* of this piece rests on a spring *n*, and to its extremity is attached a cord, wire, or thread *m*, which is secured at its other end to the rear end of the lever *c'* below or corresponding to it. When the forward end of the lever *c'* is raised by a stud in the cylinder A, the rear end thereof will be depressed, and this will draw down the branch *l''*, thus rocking the piece L on its pivot *l*. On the branch *l''* is mounted to slide a block *l'*, carrying on its end a thin flexible piece *r*, which I call a "quill." This quill is brought into position between the strings *s* by the rocking forward of the piece L, and when the bar E is moved endwise by the mechanism last described the quill *r* strikes its string or strings *s* and produces a tone similar to that produced in a like manner by hand on a mandolin. By means of a screw *q* the block *l'* may be adjusted and the quill *r* put in the proper relation with the string *s*. Lateral guides *p* are set in the bar E to keep the pieces L properly in place, and stops *o* (seen best in Fig. 4) are employed to limit the extent of upward movement of the branches *l''*.

I prefer to make the quills *r* of steel and to cover them with leather; but they may be made of other materials.

The strings or harmonic cords *s* are omitted from Fig. 4 to avoid confusion, and only

a part of them are shown in Fig. 1. The flexibility of the threads *m* permits the longitudinal reciprocation of the bar E without disturbing the position of the levers *c'*. There
 5 will be, of course, a piece L corresponding to each lever *c'*.

It will readily be seen that the instrument may be made to play any air whatever, and that my improvements may be used alone in
 10 an instrument or be combined (as herein shown) with other mechanism to produce other kinds of tones. It will also be readily understood that the piece L, which includes the branch *l''* and adjustable block *l'*, is merely
 15 a movable carrier for the quill *r*, and that its construction may be varied considerably without departing materially from my invention. It is only essential that the quills *r* shall be carried by the reciprocating bar E, and that
 20 some intermediary shall be employed whereby the movements of the lever *c'* shall serve to move the respective quills forward into a position where they will strike the strings *s* when the bar E is reciprocated.

25 Having thus described my invention, I claim—

1. In a mechanical musical instrument, the combination, with a set or series of levers *c'* and means, substantially as described, for
 30 operating said levers in their proper order, of the reciprocating bar E, extending transversely of said levers, the strings *s*, the quills *r* for vibrating said strings, carried by the bar E and moving them with an intermediary
 35 mechanism, substantially as described, whereby the said levers *c'* move their respective quills into operative position, as set forth.

2. In a mechanical musical instrument, the combination of a series or set of levers *c'*,
 40 mechanism, substantially as described, for actuating said levers in their proper order, the bar E, mechanism, substantially as described, for imparting a longitudinal reciprocating motion to said bar, the quill-carriers

L, mounted on said bar E and connected to
 45 the respective levers *c'*, substantially as described, the springs *n* of said carriers, the quills *r*, one of which is borne by each of said carriers L, and the strings or harmonic cords *s*, arranged adjacent to the respective quills
 50 *r*, substantially as described.

3. In a mechanical musical instrument, the combination of a series or set of levers *c'*, mechanism, substantially as described, for
 55 actuating said levers at the proper times, the bar E, extending transversely of said levers and adapted to be reciprocated longitudinally, the mechanism for imparting reciprocating movement to said bar, consisting of the spring
 60 F, the elbow-lever H, the rod G, coupling one arm of said lever with said bar E, the shaft B, the cam I on said shaft, the roller in the other arm of lever H and resting on said cam, the set of strings *s*, the quill-carriers I, one
 65 for each lever *c'*, pivotally mounted on said bar E and each bearing a quill *r*, the springs *n*, which uphold said carriers I, and means, substantially as described, whereby the movement of each lever *c'* is communicated to the
 70 corresponding carrier L, as set forth.

4. In a mechanical musical instrument, the combination, with the rotating cylinder A and the series of levers *c'* arranged over the same, of the reciprocating bar E, extending transversely of said levers, the set of strings *s*, the
 75 quills *r*, carried by said bar E, and means, substantially as described, whereby the said quills are controlled and moved by the respective levers *c'*, as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANCESCO ALLASIA.

Witnesses:

SECONDO CORTO,
 GIUSEPPE CROCCA.