

UNITED STATES PATENT OFFICE.

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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 586,270, dated July 13, 1897.

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To all whom it may concern:

Be it known that I, HEINRICH KAIM, manufacturer of pianofortes, of Kirchheim-under-Teck, Germany, have invented new and useful Improvements in Piano-Actions, of which the following is a specification.

My invention relates to improvements in piano-actions.

The object of my invention is to produce an improved repetition-action for pianos, and particularly for upright pianos.

My invention consists in the features, details of construction, and combination of parts, which will first be described in connection with the accompanying drawing and then particularly pointed out in the claims.

A mechanism embodying the preferred form of my invention comprises a movable portion pivotally mounted in the end of a short jack-arm, the said movable portion being operated by the aid of a spring in such a manner that it will act upon a back-catch tongue pivotally mounted on a back-catch arm on the hammer, so that after the hammer has struck the strings the jack will be immediately again thrust under the hammer-butt as soon as the slightest relaxation of pressure on the keys occurs and the hammer remains in constant proximity to the strings. The return of the hammer is effected by means of a strap secured to the back-catch tongue and coupled with a post on the jack-bed. To hold the back-catch tongue after the impact of the hammer, a wire angle-piece is provided, which is secured to the jack and which is bent into the shape of an angle broadened at its free end, and against which the back-catch tongue is pressed by the stop-pin secured to the jack-bed and having its upper end enlarged spoon shape. The angle-wire on the jack, moreover, serves to limit the upper portion of the path of the movable portion mounted on the jack, so that the hammer cannot be pressed against the strings by this tongue.

In the accompanying drawing the novel repetition-action for upright pianos is represented.

Referring to the drawing, it will be seen that the jack C is provided with an arm *c*, which has a movable portion H, pivoted to

the arm *c* and arranged to move about its pivotal attachment in the same plane as the jack, which is pivoted in the jack-bed D in any usual manner, as by inserting its end between lugs *d* and passing a pivot-pin through the lugs and the end of the jack. The movable portion H is pressed away from the jack-bed D by yielding means, such as a spring *m*, inserted between the jack-bed D and the said movable portion H and bears against the said movable portion close to its pivotal point. In this way the spring tends not only to force the free end of the movable portion H of the arm *c* away from the jack-bed, but also acts on the jack in such a manner that it tends always to thrust the longer arm of the said jack under the hammer-butt. The end of the movable portion H is preferably beveled, and upon this beveled portion rests the end of a back-catch tongue B, which is loosely suspended from the back-catch arm *a* of the hammer A by means of the bent arm *b*.

As already mentioned, the spring *m* tends to constantly press the movable portion H against the lower end of the back-catch tongue B, and the hammer is thereby held in constant proximity to the strings. Since the said movable portion and the jack-arm *c* are coupled, the spring *m* at the same time urges the jack C under or against the butt of the hammer A while raising the said hammer. The latter effect is increased by reason of the fact that after releasing or tripping the jack, which is effected by the impingement of the jack-arm *c* against the adjustable abutment *f* of the rail F, the movable portion H presses against another arm L, carried by the jack and, as shown, slightly above the arm *c*. This second arm L, which I term the "angle-arm," since it has its end bent at an angle to the main portion, contacts with a cushion *h*, carried by the movable portion H, whereby the upward movement of the said tongue is limited and the jack quickly brought back under the hammer-butt by the action of the spring *m* as soon as the pressure on the keys is relaxed in the slightest manner, the cushion *h* being for this reason at one side of the spring *m*, or, in other words, the spring *m* bears against the movable portion H between the cushion *h* and the

pivotal connection of the parts H and c. At the same time the arm L serves as a means for limiting the movement of the movable portion H for the purpose of preventing the hammer A from being pressed against the strings by the movable portion H directly.

The movement of the back-catch tongue B is limited in one direction by a device carried by the jack-bed—such as, for instance, the spoon-shaped end of the stop-pin G—while its movement in the other direction is limited by means carried by the jack itself, such as the enlarged end l of the vertical arm of the angle-piece L. The recoil or return of the hammer A is effected by any suitable mechanism, but preferably by a post J on the jack-bed D and a strap i, which connects the end of said post and the back-catch tongue B.

Having thus fully described my invention, what I claim is—

1. In a piano-action, the combination, with a hammer and a jack arranged to engage the hammer, and provided with two arms, one of which has a movable portion, of means for forcing said movable portion against the other arm, and an abutment arranged to limit the movement of said arms, substantially as described.

2. In a piano-action, the combination, with a hammer, and a jack arranged to engage the hammer, and provided with an arm having a movable portion pivoted to swing in the same plane as the jack, of means for actuating said movable portion, an abutment arranged to limit the movement of the arm and means for

engaging the movable portion to limit its movement, substantially as described.

3. In a piano-action, the combination, with a hammer, a jack-bed, and a jack pivoted to the jack-bed and arranged to engage the butt of the hammer, of a back-catch tongue carried by the hammer, means carried by the jack for limiting the movement of the back-catch tongue in one direction, and a device carried by the jack-bed for limiting the movement of said back-catch tongue in another direction, substantially as described.

4. In a piano-action, the combination, with a hammer, a jack-bed, and a jack pivoted to the jack-bed and arranged to engage the butt of the hammer, of a pair of arms secured to the jack, one of which arms has a movable portion, means for forcing said movable portion against the other arm, an abutment arranged to limit the movement of said arms, a back-catch tongue carried by the hammer and arranged to engage one of the arms carried by the jack, whereby its movement in one direction is limited, and means carried by the jack-bed for limiting the movement of the back-catch tongue in another direction, substantially as described.

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

HEINRICH KAIM.

Witnesses:

AUGUST B. DRANTZ,
CHRISTIAN BAUER.