No. 657,177. Patented Sept. 4, 1900.

A. NICKEL.

REPEATING ACTION FOR GRAND PIANOS.

(Application filed June 6, 1900.)

(No Model.) 2 Sheets—Sheet 1

FIG. 2.

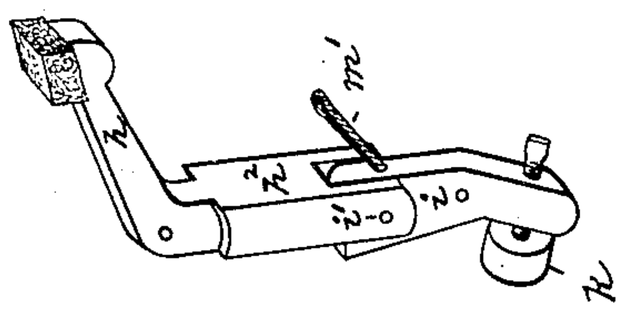

FIG. 1.

Witnesses:
John Becker.
Philip Wenger

Inventor:
Adam Nickel
by his attorneys
Roeder & Brisen

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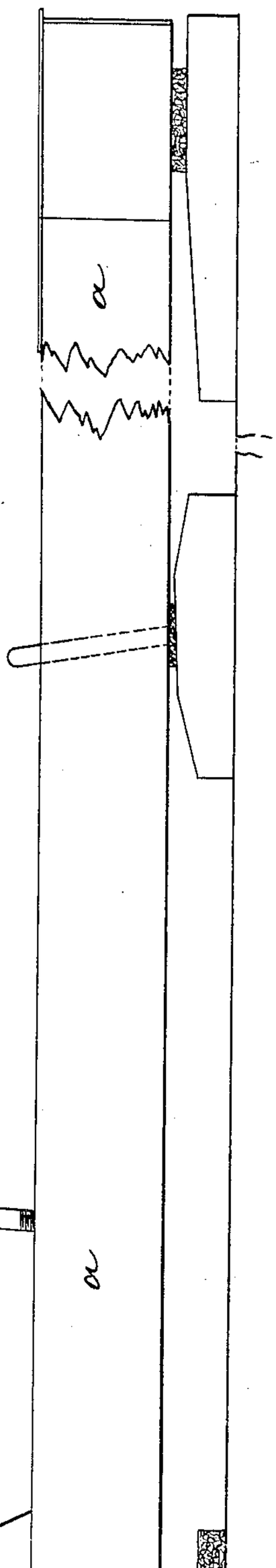

FIG. 3.

Witnesses:
John Becker.
Philip Wenger

Inventor:
Adam Nickel
by his attorneys
Roeder & Briesen

UNITED STATES PATENT OFFICE.

ADAM NICKEL, OF NEW YORK, N. Y.

REPEATING ACTION FOR GRAND PIANOS.

SPECIFICATION forming part of Letters Patent No. 657,177, dated September 4, 1900.

Application filed June 6, 1900. Serial No. 19,205. (No model.)

To all whom it may concern:

Be it known that I, ADAM NICKEL, a citizen of the United States, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Repeating Actions for Grand Pianos, of which the following is a specification.

This invention relates to a repeating action for grand pianos which avoids friction between the hammer and its actuating mechanism, prevents the hammer from lingering at the string, insures a reliable escapement, and causes the action to respond delicately to the touch.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved action, showing the key raised. Fig. 2 is a perspective view of the jack; and Fig. 3, a side elevation, partly in section, of the action with the key depressed.

The letter *a* represents the key of a grand-piano action.

a' is the back-check, *b* the capstan, and *c* the support, which is pivoted at *c'* to the flange *d'* of rear action-rail *d*.

To the support *c* is pivoted at *e'* the lever *e*, provided at its forward end with an upwardly and forwardly projecting knuckle e^2, that engages the knuckle *f'* of hammer-shank *f*, said shank being pivoted at *g'* to the flange g^2 of the front action-rail *g*.

To the forward end of the lever *e* there is pivoted at *h'*, beneath the knuckle e^2, a jointed jack, which is composed of two pivotally-connected sections. The upper section is made in the form of an elbow, having an inclined upper arm *h* and an approximately-vertical lower arm h^2, that form an obtuse angle, the pivot *h'* being situated at the bend. The lower section forms a link *i*, which is pivoted to the lower forked end of arm h^2 at *i'*, Fig. 2, and to the support *c* at i^2. The arrangement of the pivots *h' i' i²* is such that when the key is raised, Fig. 1, the pivot *i'* is slightly in advance of a straight line connecting the pivots *h' i²*. The angle of inclination of link *i* may be adjusted by a regulating-button *k*, adapted to engage support *c*, while a block-felt *l* limits the motion of the link.

A spring *m*, secured to the forward end of support *c* and engaging a loop *m'* on link *i*, tends to draw the jack forward at its joint and to thus reset the same. The tension of the spring may be regulated by a screw m^2.

The upper arm *h* of the jack is adapted to engage with its forward end a stop *n*, which is arranged below the same and is adjustably supported by a rail *n'*. Above the upper end of the arm *h* there depends from the flange g^2 a screw or adjustable stop *o*, which constitutes the "escapement" for the jack. A second screw or adjustable stop *p*, depending from flange g^2 in the rear of screw *o*, is adapted to engage the knuckle e^2 and forms a "block" or means for limiting the upward movement of the action.

The operation is as follows: Upon depressing the key the action is swung up on pivot *c'* until the jack-arm *h* contacts with escapement *o*, which will cause the jack to fold backward somewhat at its joint *i'*. The motion imparted to the action will carry the same up until its progress is arrested by the contact of knuckle e^2 with block *p*, which contact serves to still further fold the jack and also to limit the upward movement of the action. The hammer having been swung upward by the knuckle e^2 during the rising of the action, will complete its stroke after the action has been arrested by the stop *p*, and in this way the last portion of the hammer-stroke is performed by inertia only, so that any lingering at the string *q* is prevented. After the hammer has struck the string it recoils and falls back against the back-check *a*, when the parts will occupy the position illustrated in Fig. 3. Upon a partial release of the key the back-check will release the hammer, and as the capstan *b* descends and takes the pressure off support *c* the spring *m* will right the jack by drawing it forward at its joint *i'*. As the jack is thus straightened it will slightly raise the lever *e*, and consequently the hammer; but here again the block *p* limits the movement of the action, so that the hammer, which has now no upward impetus, cannot contact with the string. Should the spring *m* for any reason fail to promptly straighten the jack at its joint *i'*, then as the action descends the free end of the jack-arm *h* will contact with the stop *n*, and thus the combined weight of the action and hammer will cause the jack to be

started, so that the spring is assisted and can readily perform its function of resetting the jack.

Upon a complete release of the key the parts are all returned to their normal position. (Illustrated in Fig. 1.)

What I claim is—

1. In a grand-piano action, a jointed jack having an upper elbow, a lever to which the elbow is pivoted, and a hammer actuated by the lever, substantially as specified.

2. In a grand-piano action, a jointed jack having an upper elbow, a lever to which the elbow is pivoted, a hammer actuated by the lever, an escapement-stop adapted to engage the elbow, and a block-stop adapted to engage the lever substantially as specified.

3. In a grand-piano action, a jointed jack having an upper elbow, a lever having a knuckle and pivotally connected to the elbow, and a hammer-shank having a knuckle that engages the lever-knuckle, substantially as specified.

4. In a grand-piano action, a jointed jack having an upper elbow, a lever having a knuckle and pivotally connected to the elbow, a hammer-shank actuated by the lever, and an escapement-stop that is adapted to engage the elbow, substantially as specified.

5. In a grand-piano action, a jointed jack having an upper elbow, a lever to which the elbow is pivoted, an escapement-stop adapted to be engaged by the upper side of the elbow, a second stop adapted to be engaged by the lower side of the elbow, and a spring that influences the jack, substantially as specified.

6. In a grand-piano action, a jointed jack composed of an upper elbow and a lower link, combined with a lever to which the elbow is pivoted, and a support to which the link is pivoted, substantially as specified.

7. In a grand-piano action, a jointed jack composed of an upper elbow and a lower link, combined with a lever to which the elbow is pivoted, a support to which the link is pivoted, an escapement-stop adapted to engage the elbow, and a spring that influences the jack, substantially as specified.

8. In a grand-piano action, a jointed jack composed of an upper elbow and a lower link, combined with a lever to which the elbow is pivoted, a support to which the link is pivoted, and a regulating-button carried by the link and adapted to engage the support, substantially as specified.

9. In a grand-piano action, the combination of the following elements: a jointed jack composed of an upper elbow and a lower link, a lever to which the elbow is pivoted, an escapement-stop above the elbow, a block-stop above the lever, a stop below the elbow, and a spring that influences the jack, substantially as specified.

Signed by me at New York city, county and State of New York, this 5th day of June, 1900.

ADAM NICKEL.

Witnesses:

PHILIP MENGES,

F. v. BRIESEN.