(No Model.)

L. C. MERKEL.

UPRIGHT PIANO ACTION.

No. 473,944. Patented May 3, 1892.

Fig. I.

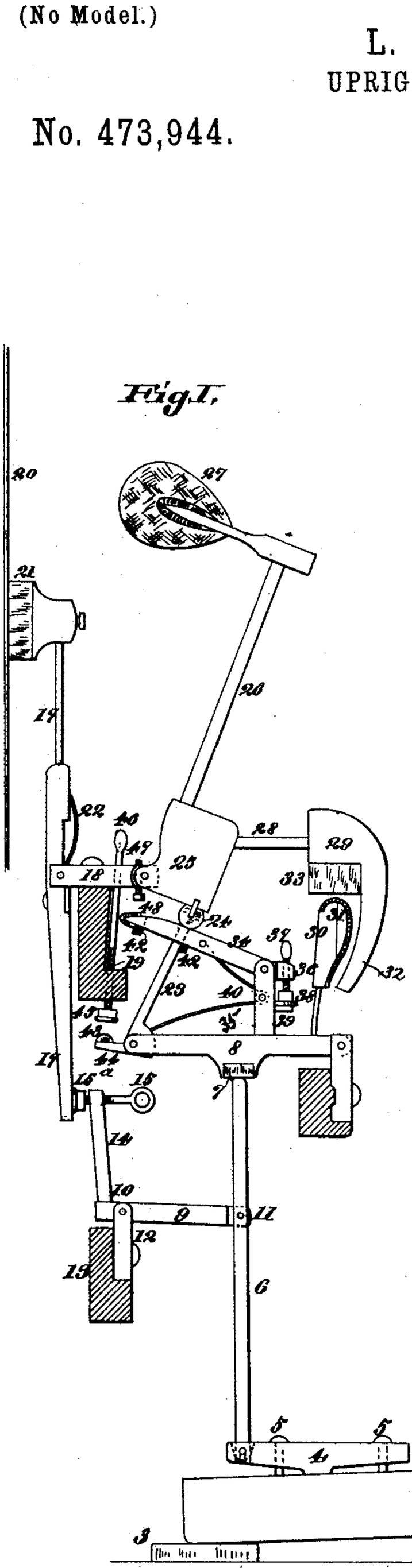
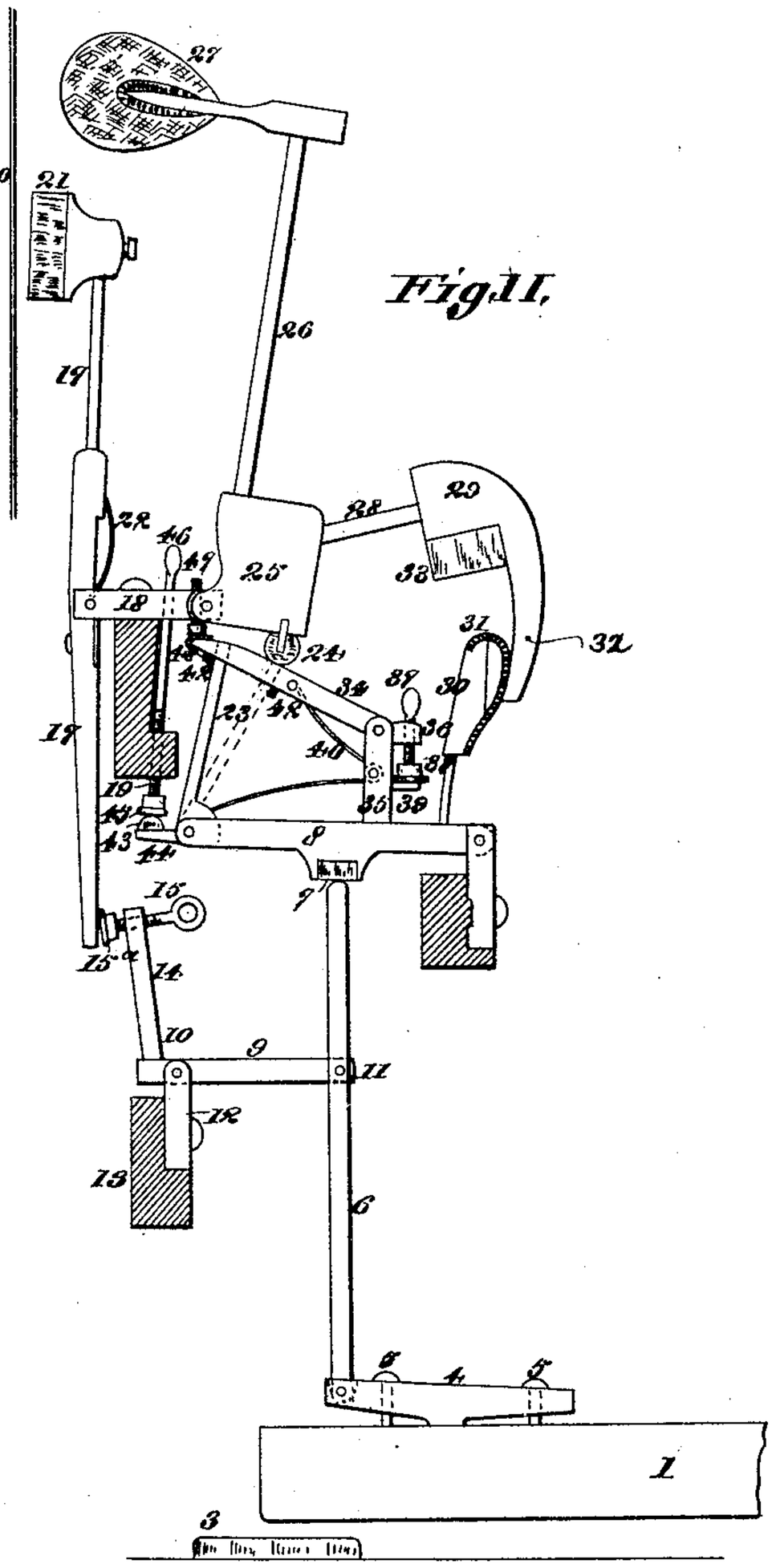


Fig. II.



Attest;
Geo. E. Crum.
Harry D. Roberts.

Inventor;
Louis C. Merkel.
By Knight Bros.
Attys.

UNITED STATES PATENT OFFICE.

LOUIS C. MERKEL, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO ARTHUR A. MERSMAN AND FREDERICK C. MERSMAN, OF SAME PLACE.

UPRIGHT-PIANO ACTION.

SPECIFICATION forming part of Letters Patent No. 473,944, dated May 3, 1892.

Application filed May 15, 1891. Serial No. 392,834. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. MERKEL, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Upright-Piano Actions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The purpose of this invention is to so modify the grand-piano action as to make it applicable to upright pianos, and to accomplish this a number of novel features have been introduced, which will be set forth in the claims.

Figure I is a side elevation of the action in normal position. Fig. II is a side elevation of the same in position for rapid repetition of the note.

1 is the inner portion of one of the piano-keys. This has the usual fulcrum-support at 2 and cushion 3, upon which the inner end of the key rests when in normal position. At the inner end of the key is an adjusting-bracket 4, having a central bearing upon the key, and an adjusting-screw 5 at each side of the bearing, by which the bracket is secured to the key.

6 is the lifting-rod, whose lower end is hinged to the bracket and whose upper end bears against a cushion 7 at the under side of the action-supporting lever 8. The lifting-rod is guided by the horizontal arm 9 of a bell-crank lever 10, being hinged at 11 to the arm. The bell-crank lever 10 is fulcrumed to a standard 12 upon a rail 13, that runs the whole width of the piano. The vertical arm 14 of the bell-crank carries a screw 15, having at the end a knob or cushion 15ª, bearing against the lower end of the damper-lever 17. The damper-lever is fulcrumed to a bracket 18 upon a fixed rail 19, extending across the piano.

20 represents a piano-string.

21 is the cushioned damper.

22 is a spring holding the damper normally against the string. When the outer end of the key is depressed, the lifting-rod is thrown upward, and the damper is swung away from the string by the movement of the bell-crank lever 10. (See Fig. II.)

23 is the jack hinged to the free end of the action-supporting lever 8 and normally bearing against the cushion 24 at the under side of the hammer block or butt 25, that is hinged to the bracket 18 and carries the hammer-rod 26.

28 is a rod extending horizontally forward from the hammer block or butt and carrying a head 29, whose weight tends to carry the hammer away from the string into its normal position. (See Fig. I.)

Near the fulcrum end of the lever 8 is the check 30, having a cushion 31 and elevated some distance above the lever 8, so that the upward movement of the lever carries the check forward.

32 is a curved downward extension of the head, whose inner side comes in contact with the cushion of the check as the hammer is leaving the string and before the key returns to its normal position, so as to check the motion of the hammer. The head has a cushion 33, that prevents noise when the head impinges on the top of the check as the hammer reaches its normal position.

34 is the repeating-lever, fulcrumed to a standard 35 upon the lower lever 8.

36 is a forward projection upon the lever 34, carrying a screw 37, whose lower end has a cushion 38, that impinges upon a projection 39 of the standard 35 to limit the upward movement of the free end of the lever 34. The free end of the lever is raised by a V-formed spring 40, having central bearing in the standard 35, and whose ends bear, respectively, against the lower side of the lever 34 and a projection 41 at the front side of the jack. The spring, in addition to lifting the lever 34, tends to carry the jack into its normal position beneath the cushion 24 of the hammer-butt. (See Fig. I and broken lines, Fig. II.) The upper end of the jack passes through an aperture in the lever 34, and the jack is limited in its oscillation by cushions 42 at the ends of the aperture. As the lever 8 is thrown upward the cushion or knob 43 upon a projection 44 of the jack impinges

against a head or cushion 45 at the lower end of a screw 46 and throws the upper end of the jack from beneath the cushion 24, so as to allow the hammer to fall away from the string. The screw 46 works in the rail 19. As long as the key is fully depressed the upper end of the jack is held out of contact with the cushion 24; but the spring 40 sustains the lever 34 and the cushion 24 rests upon the lever, and this, together with the check 30, prevents the hammer falling back to its normal position and keeps it in the position seen in Fig. II, ready for a rapid repetition of the stroke. As the key rises a little distance the lever 8 drops and removes the cushion 43 of the jack from the head 45 of the screw 46, and the spring 40 carries the upper end of the jack beneath the cushion 24, when another pressure upon the key causes a quick repetition of the note, the hammer being in close proximity to the string 20.

47 is a screw working in the bracket 18, and 48 is a cushion upon the end of the lever 34, which impinges on the end of the screw as the lever rises, and thus forms a limit to its ascent, the screw 37 limiting the ascent of the free end of the lever 34, (as has been already said,) except when the lever is in its uppermost position.

I will briefly set forth some differences between this device and the piano-actions before known. The weighted rod or arm 28 29 dispenses with the bridle-strap used heretofore to draw the hammer from the string. The back-check being upon and elevated above the lever 8 gives it the required backward and forward motion to engage and release the head 29. The use of a weight to draw the hammer from the string gives a uniform touch to the keys, as the weight is unchangeable, while the springs are liable to vary in strength. There is no lost motion between the key and the hammer, as the hammer is supported by the action in its normal position, instead of a fixed rail as in some cases. There is a ready and efficient device for regulating the movement of the damper. All the adjusting-screws can be reached from the front without the removal of any of the actions.

I claim as new and of my invention—

1. The combination, in an upright-piano action, of the lever 8, supporting the jack 23 and the repeater-lever 34, the check 30, standing upon the lever 8, and a hammer having a weighted arm or rod 28, with head 29, adapted to rest on the check when in normal position and having a projection 32, adapted to engage the check when the parts are in the position for repetition of the note, substantially as set forth.

2. The combination, with the lifting-rod 6 and damper-lever 17, of the bell-crank lever 10, connected to the lifting-rod and carrying a screw 15, adapted to impinge against the lever, substantially and for the purpose set forth.

3. The combination, in an upright-piano action, of the lever 8, the check 30 thereon, and the hammer having a weighted arm or rod 28, with head 29, adapted to arrest the downward movement of the hammer, substantially as set forth.

4. The described construction of the levers 8 and 34, the jack 23, the spring 40, the hammer having weighted arm or rod 28, with head 29, and the check 30 upon the lever 8, substantially as and for the purpose set forth.

LOUIS C. MERKEL.

Witnesses:
SAML. KNIGHT,
BENJN. A. KNIGHT.