(No Model.)

S. R. PERRY.

PIANO ACTION.

No. 565,502. Patented Aug. 11, 1896.

FIG. 1

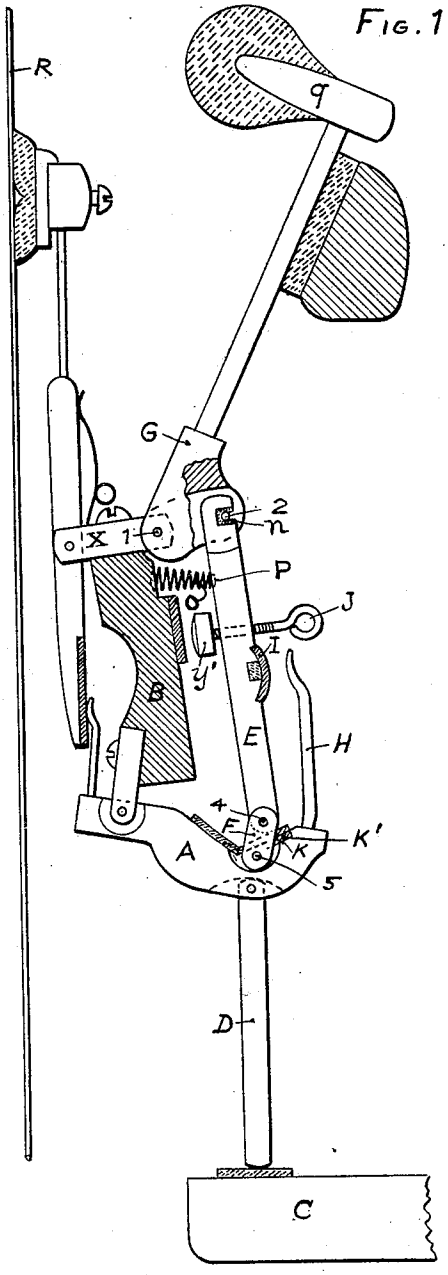
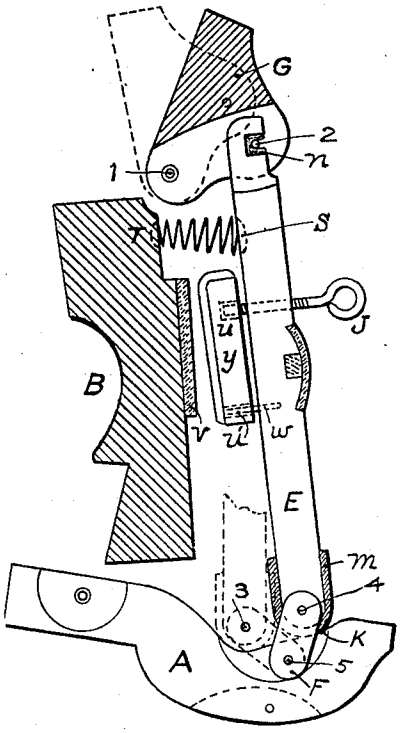


FIG. 2



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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 565,502, dated August 11, 1896.

Application filed February 21, 1894. Serial No. 501,040. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. PERRY, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain Improvements in Piano-Actions, of which the following is a specification.

My invention relates to piano-actions of the kind known as "double-link" actions; and it consists of certain novel constructions and combinations of parts, so arranged that the long links and hammer-butts of a piano-action may be easily and quickly connected or separated, the hammer-butts and long links being held in position by a spring; also, the placing of said spring in such position that its force is exerted to perform three distinct functions.

It also consists of extending the long link downward beyond its pivotal connection with the short link, so that the long link may rest directly on the jack-lever, thereby receiving the force of the blow directly from the jack-lever and relieving the short link of the strain which would naturally come upon it if the long link and jack-lever were separated, as is the case in all former applications of the double-link principle to piano-actions.

It also consists of beveling the jack-lever at its connection with the long link to form a seat and buffer for the extended part of the long link.

It consists also of a novel back-check block removable from the link and easily adjusted. These improvements, with slight modifications, will apply to grand or square piano actions.

In the accompanying drawings, Figure 1 represents a side elevation of an upright-piano action, and Fig. 2 a detailed view of the long link and the back-check block.

In constructing my invention I employ the jack-lever A, which is connected to the action-rail B in the usual manner and is also connected to the key C by an extension-lever D. I also employ the long and short links E and F with modifications, as shown by my former patent, No. 406,405, Reissued No. 11,138, January 6, 1891, and the said links are here connected to the hammer-butt G and jack-lever A for the purpose, as heretofore, of making a direct and positive connection of all the parts, thus insuring a positive repetition of the stroke.

The jack-lever A is provided with a post or spoon H, which is adjusted toward the cushion I on the long link E and which serves to force the link provided with an adjusting device J toward the action-rail B. The jack-lever is covered upon its upper surface K with various cloths and leather K', which serves to form a seat for the lower end of the long link. The long link E is made so that its lower end is extended beyond its pivotal connection 4 with the short link F, so that the extension may rest upon the cushion K' on the jack-lever and receive the full force of the blow dealt by the key, thus relieving the center-pins 4 and 5 of the short link from the strain of the blow.

The upper surface of the jack-lever, which forms a seat for the long link below its connection with the short link, may be square. I prefer to bevel it to a suitable degree, as shown in the drawings, and when so beveled it serves not only as a seat for the extended long link, but also as a buffer to hold the two links at the proper angle, the cushion on the beveled surface taking the place of the extra buffer-cushion (between the lower end of the post and the long link) heretofore necessary.

The short link is made use of to connect the long link to the jack-lever and as a swing to carry the long link from point 4 to point 3, Fig. 2, on the jack-lever. The short link in operation will describe an arc of a circle from 4 to 3, and in doing so will lift the long link clear from its seat on the jack-lever without friction, so that the seat of cloth will remain intact for many years.

As shown in Fig. 2, the long link may be cushioned, as at *m*, and the upper surface of the jack-lever *k* be left without cushions, or they may be both cushioned more or less; but in any case the long link is required to be extended beyond its pivotal connection with the short link to a union with the jack-lever sufficient to receive the force of the blow and relieve the short link of the strain.

On the upper front face of the long link I form across its surface a groove *n*, which is bushed with cloth and serves to connect the long link with the hammer-butt. Directly back of the long link and fastened to the up-

per edge of the action-rail B is a spring O, Fig. 1. The force of this spring is directed toward the long link, which has a corresponding hole P to receive the loose end of the spring. This spring performs three distinct functions: first, it holds the groove *n* in the long link into connection with the center-pin 2 of the hammer-butt; second, using the above-cited connection as a fulcrum, it forces the links into place on the jack-lever 4 and 5; third, as the center-pin 2, connecting the hammer-butt G and long link E, is on a line higher than the center-pin 1, which serves to connect the hammer-butt with its flange *x*, the spring, exerting its force against the long link, tends to retard the movement of the hammer *q* to an extent sufficient to keep the hammer from jarring against the string R, a matter of importance in obtaining a pure tone.

The dotted line shows the hammer-butt G, Fig. 2, in its extreme position toward the string. The leverage of the spring to retard the forward movement of the hammer will be apparent.

If preferred, the spring O may be fastened into the long link, as shown by S, Fig. 2, and its loose end placed in a hole T, bored into the opposite edge of the action-rail.

The checking device, as shown by *y*, Fig. 2, is made in the shape of a rectangular block with two holes *u u'*, both bushed, into one of which the screw-eye J is forced. The screw-eye J serves to adjust the block *y* toward the cushion *v* on the action-rail B, while the pin *w*, projecting from the long link and made to enter the lower hole of the block, serves to hold the block in place. This block, from the fact that it is oblong in shape, can be made any dimension suitable and carry more surface as a check to the hammer in its receding movement from the string than is obtainable from a round button, Fig. 1, of the maximum dimensions suitable.

I do not confine myself to either of the adjusting devices shown in Figs. 1 and 2, as any adjusting device attached to the long link and operating between the long link and the face of the action-rail, and adapted to check the progress of the hammer backward after the stroke is made, can be used.

Having fully described my invention, I make the following claims:

1. In a piano-action the long link projecting below its pivotal connection with the short link and resting upon the jack-lever substantially as described.

2. In a piano-action the long link projecting below its pivotal connection with the short link and resting upon the jack-lever, in combination with the short link attached to the jack-lever substantially as set forth.

3. In a piano-action the long link provided with a screw-eye and a guide-pin in combination with a block attached to said long link for the purpose set forth.

4. In a piano-action the combination of a spring operating between the upper edge of the action-rail and the long link, said long link provided with a groove across its upper surface, a center-pin as 2 connecting the hammer-butt and long link on a line above a pin as 1 connecting the hammer-butt and its flange and the long link projecting below its connection with the short link and resting upon the jack-lever, the short link connecting with the jack-lever, all as described and for the purposes set forth.

5. In a piano-action the combination of a center-pin connecting the hammer-butt and the long link, passing through said hammer-butt on a line above the center-pin which connects the hammer-butt with its flange for the purpose set forth, a spring operating between the upper edge of the action-rail and the long link; the long link provided with a groove across its upper surface, also provided with a screw-eye and a checking device; said link hinged to jack-lever by means of a short link and extending beyond its connection with the short link to a seat on the jack-lever, and said jack-lever operated by the key and provided with a post substantially as set forth.

6. In a piano-action the long link connected to the hammer-butt, the short link connecting the long link with the jack-lever, a spring operating between the action-rail and the long link, the long link provided with an adjustable checking device adapted to come in contact with the face of the action-rail, the jack-lever provided with an adjustable post, the long link extending below its connection with the short link and resting upon the jack-lever, substantially as set forth.

7. In a piano-action, the seat on the jack-lever at its connection with the long link, suitably beveled, in combination with the long link extending below its connection with the short link substantially as set forth.

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