

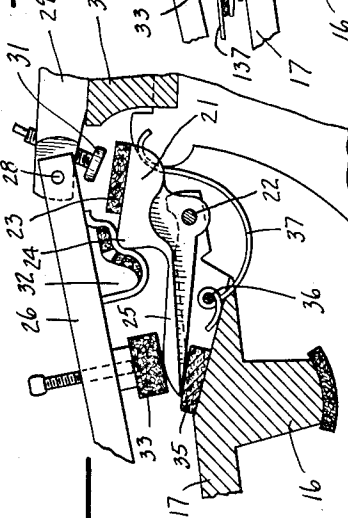
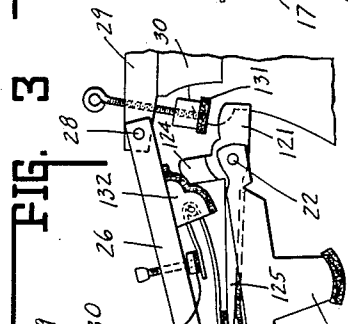
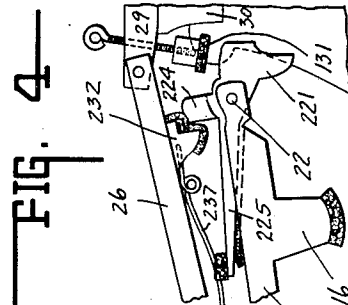
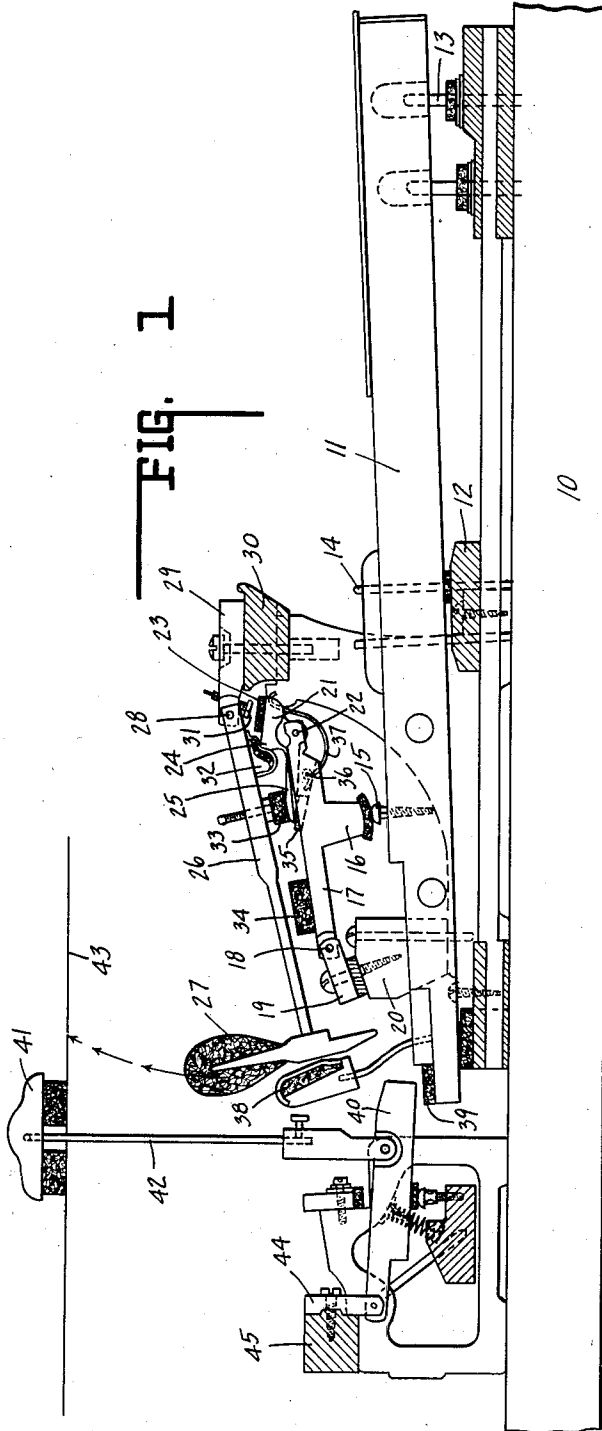
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PIANO ACTION

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## UNITED STATES PATENT OFFICE

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## PIANO ACTION

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4 Claims. (Cl. 84—239)

This invention relates to a piano action, particularly to that type of action applicable to use in a so-called "grand piano."

The principal object of the invention is to provide a simplified action such as may lower the cost of production over the present conventional grand piano action, and at the same time requiring less overhead space so as to permit the construction of a grand piano embodying such action approximately two inches lower from the top of the keybed to the top of the rim. The efficiency of the action, both as to repetition and general function is not sacrificed in attaining such advantages.

The principal feature of the invention resides in the complete elimination of the conventional repetition lever. In its place there is provided a new type of jack, which combines the function of the conventional jack and the conventional repetition lever. This is accomplished by so forming and mounting the jack as to cause its return under the hammer butt before the hammer returns to its position of rest. As a result thereof, such jack performs in addition to its usual function, the same function as the conventional repetition lever in the usual piano action. In this connection it may be noted that the let-off screw and regulating button both function in connection with the jack acting in the capacity of a combination jack and repetition lever. This construction reduces the number of parts of the action, simplifies its regulation, and renders it more compact, all without impairing the efficiency of the action.

The full nature of the invention will be understood from the accompanying drawing and the following description and claim:

Fig. 1 is a side elevation of the unit action. Fig. 2 is an enlarged side elevation of the jack and a portion of the wippen with parts broken away. Fig. 3 is the same as Fig. 2 on a reduced scale showing a modified form of spring. Fig. 4 is the same as Fig. 3, showing a second modified form of spring.

In the drawing there is shown for illustrative purposes one unit of a piano action mounted upon the piano keybed 10. Supported upon the keybed there is shown a natural piano key 11 pivotally supported upon the balance rail 12 and provided with recesses for receiving the guide pin 13 and the balance pin 14. Toward the operating end of the key there is provided the usual capstan screw 15 positioned to engage the cushioned projection 16 extending downwardly from the wippen 17.

The wippen 17 is pivoted at 18 to the flange 19 secured upon the flange rail 20, said flange rail being rigidly supported upon the keybed 10. At the free end of the wippen, a jack 21 is pivotally mounted at 22. The jack is provided with a head portion having a cushion 23 and a heel portion indicated at 24. It is further provided with a tail indicated at 25, its pivotal mounting 22 being arranged immediately below the head portion and at a substantial distance forwardly from the rear end of the tail portion.

Immediately above the wippen and jack there is located the usual hammer lever 26 having a hammer 27 on its free end and pivoted at 28 to a flange 29 at its opposite end and above the head portion of the jack. The flange 29 is supported upon and secured to the action rail 30. The flange 29 is also provided, adjacent its pivotal connection with the hammer lever, with an adjustable let-off screw 31. Also above the jack the hammer lever is provided with a recessed cushioned hammer butt 32. The hammer lever has mounted thereon at a position above the tail end of the jack, a cushion regulating button 33. The wippen is provided with a cushion 34 directly below the intermediate portion of the hammer lever and a slotted end to form bifurcated ears between which the reduced portion of the jack extends so that it may rock about its pivotal mounting on the wippen between the bifurcated ends and within the recessed portion thereof, there being positioned within the wippen a cushion 35 against which the tail end of the jack bears. Also secured within the recessed portion of the wippen at 36 there is a spring 37 which curves upwardly into bearing relation with the recessed portion in the forward end of the jack head.

The relative arrangement and positions of the above described parts are such that the heel 24 of the jack head is adapted to engage the hammer butt 32 when the wippen is actuated, and the tail portion 25 of the jack is adapted to engage with the regulating button 33 and be cushioned by the cushion 35. The action of the jack is effected by contact of the cushion 23 with the let-off screw 31. The relative movement of these parts and elements, as between the jack and hammer lever upon actuation of the wippen, is such as to perform the combined function of the conventional jack and the conventional repetition lever.

At the rear end of the piano key there is provided the usual back check 38 extending upwardly from the key to a position adjacent the ham-

mer. Also the rear end of the key is provided with the usual cushion 39 for engagement with a damper lever 40 upon which the damper 41 is pivotally mounted through a damper arm 42 and in position to normally rest upon the piano string 43 against which the hammer 27 is adapted to impinge. The damper lever 40 is pivotally connected to a flange 44 secured to the back rail 45.

In the striking operation, the free end of the wippen will be moved upwardly, carrying the jack therewith. The heel 24 of the jack, being in engagement with the hammer butt, will throw the hammer upwardly towards the string in striking position therewith. During the upward movement of the jack, the head 21 will engage the let-off screw 31, tilting the jack forwardly about its pivotal mounting 22 on the wippen so as to hold the heel 24 forwardly of the hammer butt and permit the free rebound of the hammer. However, upon the rebound of the hammer, the regulating button 33 will engage the tail end 25 of the jack and thereby return it to its normal position upon the cushion 35. This return movement of the jack to repetition position is further assisted by the spring 37.

In the modified form shown in Fig. 3, the jack 125 is provided with a head 121 positioned for engagement with the let-off screw 131. It is also provided with the heel 124 extending into operative engagement with the hammer butt 132. In this construction the spring 137 is pivoted intermediate its ends to the hammer butt so that one free end bears against the regulating button 33 and the other free end against the tail portion of the jack 125 so that after the striking action, the regulating button through the tension of the spring 137 will immediately return the jack to its normal striking position for ready repetition of the action.

In the modified form of Fig. 4 the jack 225 is provided with a head of slightly different form indicated at 221 and having the heel portion 224 initially and normally bearing against the hammer butt 232. In this arrangement a spring 237 has one end secured to the hammer butt and the other free end bearing under spring tension upon the end of the tail portion of the jack 225. This arrangement similarly acts to quickly return the jack to its initial position for repetition of the action.

The invention claimed is:

1. A piano action including a piano key, a supporting frame for said key, a wippen extending over and spaced above said key and provided with a downwardly-extending projection intermediate its ends positioned to be struck thereby, said wippen being pivotally mounted on said frame at one end thereof and carrying a pivotally mounted jack on its free end, a hammer lever extending above said wippen and jack with one end pivoted on said frame adjacent thereto, said lever carrying thereon a hammer butt and a regulating button, and a let-off screw adjustably mounted on said frame adjacent the pivoted end of said lever, said jack comprising a head portion having a heel for engagement with the hammer butt and a forwardly extending portion for engagement with said let-off screw, said jack also including a tail portion positioned for engagement by said regulating button, whereby actuation of said wippen will cause said jack to actuate the hammer through the

heel portion thereof and be disengaged upon engagement of the let-off screw for permitting rebound of the hammer and be returned to normal position by the regulating button engaging the tail portion thereof.

2. A piano action including a piano key, a supporting frame for said key, a wippen pivotally mounted at one end thereof on said frame and provided with a projection intermediate its ends positioned to be struck by said key, a hammer lever having a hammer on its free end and pivotally supported on said frame at its other end to extend above and be struck by said wippen, a jack pivotally mounted upon the free end of said wippen, said jack being provided with a tail portion and head having a heel and a forwardly extending portion, the tail portion extending over the wippen, a hammer butt on said hammer lever positioned to be engaged by the heel, a let-off screw on said frame adjacent the pivotal mounting of the hammer lever positioned to be engaged by said forwardly extending portion, and a regulating button on said hammer lever positioned to engage the tail portion of the jack upon release thereof.

3. A piano action including a piano key, a frame upon which said key is supported, a wippen pivotally mounted at one end thereof on said frame and provided with a projection intermediate its ends positioned to be struck by said key, a hammer lever having a hammer on its free end and pivotally supported on said frame at its other end to extend above said wippen, a jack pivotally mounted upon the free end of said wippen, said jack being provided with a tail portion and head having a heel and a forwardly extending portion, the tail portion extending over the wippen, a hammer butt on said hammer lever positioned to be initially engaged by the heel to activate said lever, a let-off screw on said frame adjacent the pivotal mounting of the hammer lever positioned to be engaged by said forwardly extending portion, a regulating button on said hammer lever positioned to engage the tail portion of the jack upon release thereof, and a spring mounted on said lever to engage said jack under spring tension for returning it after actuation to normal position for repetition of the action.

4. A piano action including a frame, a wippen pivoted at one end thereof, a piano key supported on said frame in position to engage and actuate said wippen, a hammer lever pivotally supported at one end to said frame and having a regulating button and a hammer butt thereon, a let-off screw on said frame adjacent the pivoted mounting of said hammer lever, and a jack pivotally supported upon the free end of said wippen having a head positioned to engage said let-off screw upon actuation of said key, said head including a heel engageable with said hammer butt for imparting initial action to said hammer lever, said jack being further provided with a tail portion extending in position to be engaged by said regulating button upon said heel being withdrawn from engagement with the hammer butt through engagement thereof with the let-off screw, the jack being returned to normal position by the rebound of the hammer lever through engagement of its tail portion by said regulating button.

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