Dec. 21, 1937. A. A. HUSEBY 2,102,898

PIANO

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Fig. 1

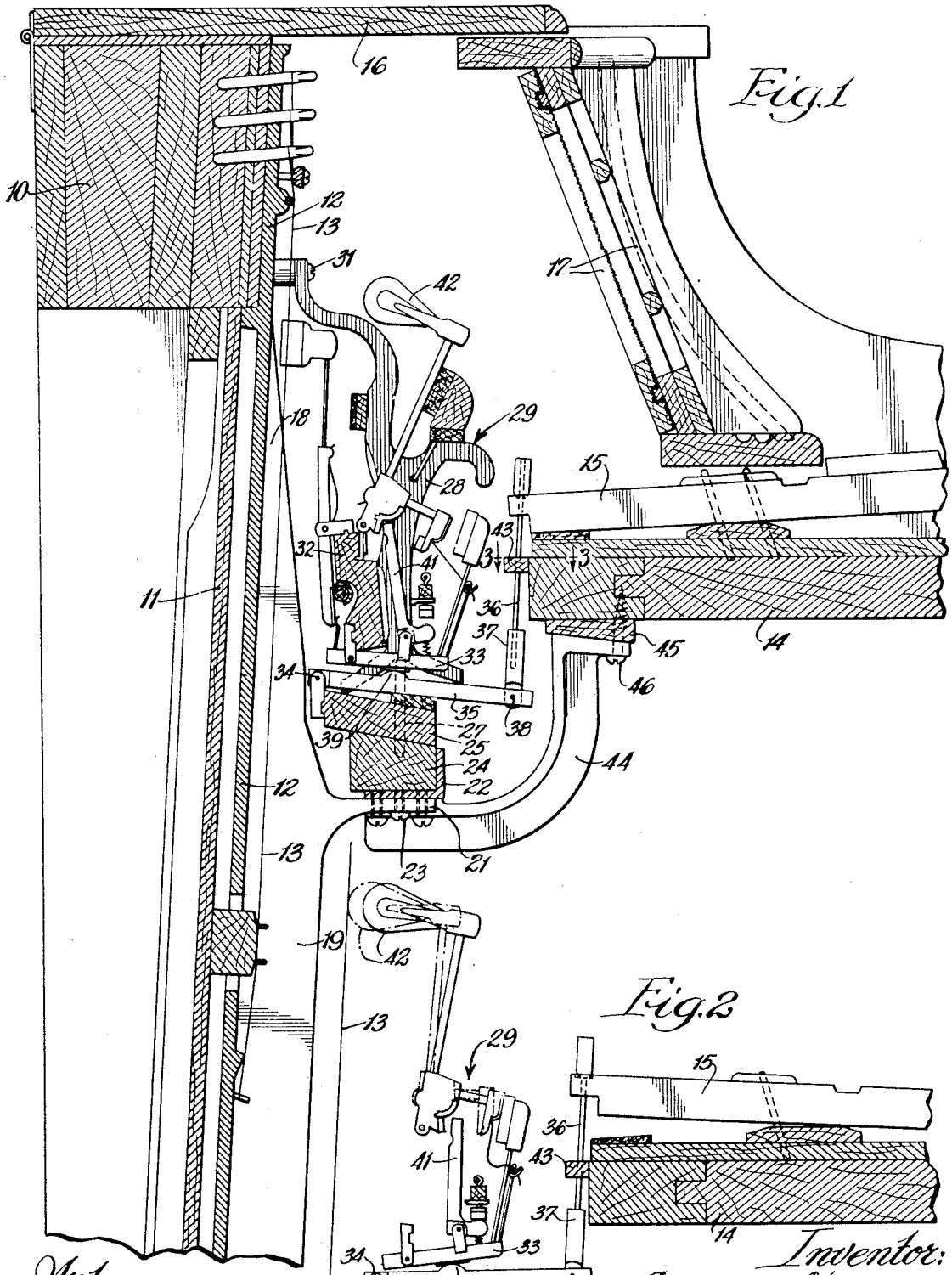


Fig. 2

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Fig. 3

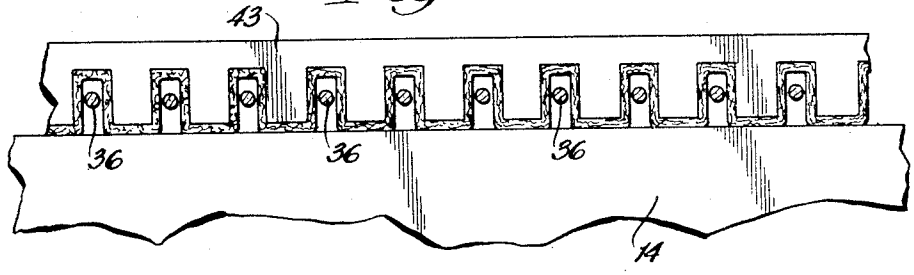
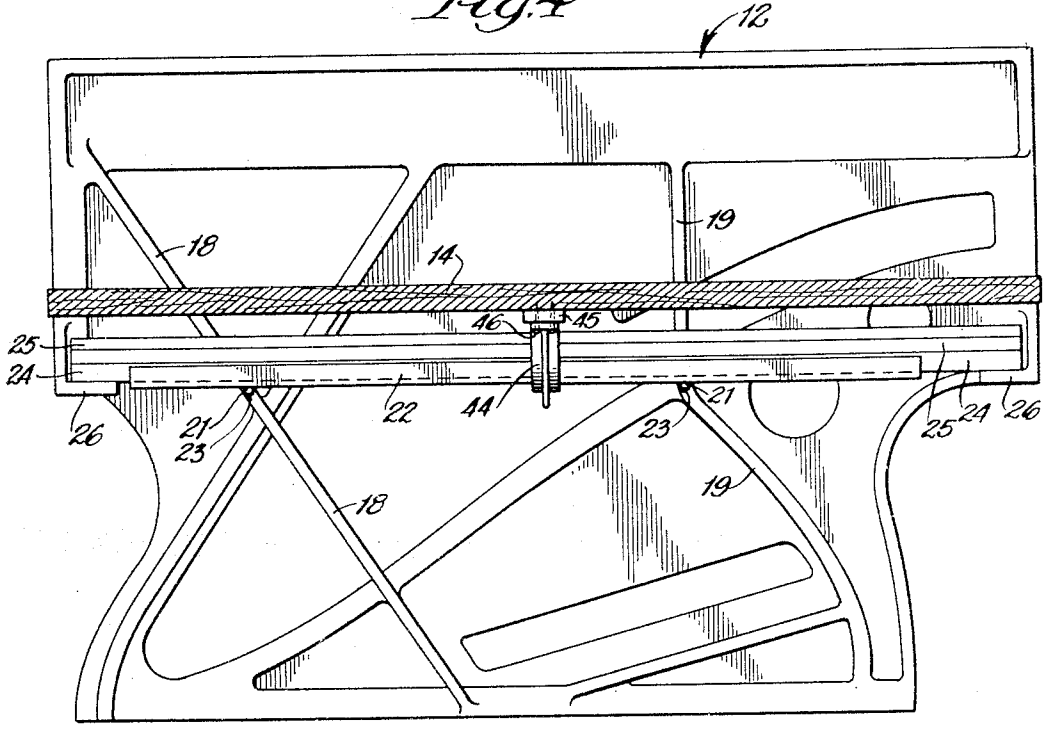


Fig. 4



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UNITED STATES PATENT OFFICE

2,102,898

PIANO

Albert A. Huseby, Oak Park, Ill.

Application October 21, 1936, Serial No. 106,716

10 Claims. (Cl. 84—240)

This invention relates to pianos, and has reference more particularly to a modern type of upright piano characterized by a substantially reduced over all height as compared with the standard upright piano of an earlier period, and known in the trade as "underslung action" instruments. In such earlier type of upright piano the entire action is located above the level of the key bed and is actuated by upwardly extending abstracts from the inner ends of the keys. The reduction in the height of the case and the string plate in the low modern type referred to has resulted in a corresponding lowering in location of the action to a position substantially opposite the key bed and keys, the action rail being somewhat below and the hammers somewhat above the level of the keys.

This change has brought the wippens to a position below the level of the keys, and consequently has involved the replacement of the upwardly extending abstract which exerted a push or kick on the wippen by a depending abstract suspended from the inner end of the key which, through a lever system, actuates the wippen upwardly when the key is depressed; and one object of the present invention has been to provide an improved lever system for actuating the wippen from the depending abstract that will afford increased leverage and a lighter touch to the instrument.

Again, in the modern type of low upright piano referred to it has been the practice to support the inner or rear edge of the key bed only at its two ends on brackets on the upright side edges of the string plate or on ledges on the side walls of the piano case, and if, as often happens, the key bed sags ever so slightly, it disturbs the correct adjustment of the depending abstracts and consequently reduces the throw of the wippen and jack and the force of the hammer blow; and another object of the present invention has been to provide improved supporting means for the inner or rear edge portion of the key bed which will render impossible the sagging thereof and will maintain constant the adjusted throw of the wippen and jack and the force of the hammer blow.

Another object is to provide a construction which will permit the underslung action to be bodily lifted out of the piano case without disturbing the keys and their wippen-actuating means; and another object is to provide a construction which will readily enable any key to be inserted and removed without interference from the hammer rail or any other part of the action.

Still other objects and attendant advantages of the invention will be apparent to persons skilled in the art from the following detailed description, taken in connection with the accompanying drawings, in which I have illustrated one practical and approved embodiment of the invention, and wherein:—

Fig. 1 is a vertical front-to-rear section of the piano, broken off at the bottom and broken out through the key bed, showing the movable parts of the action in side elevation.

Fig. 2 is a fragmentary view of the key bed and parts of the action, showing the position of the latter when a key has been struck.

Fig. 3 is an enlarged fragmentary top plan view of an abstract guide, with the abstracts in section on the line 3—3 of Fig. 1.

Fig. 4 is a front elevation of the string plate, showing in section the inner edge portion of the key bed and in front elevation an angle bar and rail and a central supporting bracket for the key bed; the action being omitted for the sake of clearness.

Referring to the drawings, and first pointing out parts that are counterparts of corresponding elements of a standard upright piano, 10 designates the pin block, 11 the sounding board, 12 the ribbed string plate, 13 the strings, 14 the key bed, 15 the keys fulcrumed intermediate their ends, 16 the hinged cover or lid of the case, and 17 the removable upper front panel of the case.

Cast integral with the two ribs 18 and 19 (Fig. 4) of the string plate are forwardly extending horizontal arms 21 located in the same horizontal plane, and resting on and across these arms 21 is an angle bar 22 secured to the arms by screws 23; and seated in the angle bar 22 is a wooden rail comprising lower and upper sections 24 and 25. As shown in Fig. 4, the two sections of this rail rest on shoulders or ledges 26 of the string plate 12. Fitted into holes in the rail 24, 25 are pins or posts 27, on the upper ends of which are stepped the side frame members 28 of the piano action designated as an entirety by 29, the side frame members 28 being attached at their upper ends to the string plate by screws 31. Connecting and spacing the side frame members 28 is the usual action rail 32.

The action, designated generally by 29, is the standard upright piano action, the parts of which are old and well known, and hence the same need not be herein described in detail; but in this underslung arrangement it will be observed

that the action is located, not above, but directly opposite the key bed and keys, so that the wippens 33 of the action, which underlie the action rail 32, are considerably below the level of the keys 15.

Pivoted at 34 on the rear side of the rail section 25 are levers 35 of the second class that underlie the wippens 33 and extend across and forwardly of the rail 24, 25. Suspended from the inner ends of the keys 15 are abstracts in the form of wire links 36, each having threaded engagement at its lower end with a coupling sleeve 37 that, in turn, is pivoted at 38 to the forward end of lever 35, whereby the effective length of the abstract can be nicely adjusted. On the upper side of each lever 35 is a wippen contact button 39 that, when the lever is raised by the depression of the key 15 elevates the wippen 33 and, through the jack 41, throws the hammer 42 against the string. The abstract wires 36 extend through and are guided by a notched felt lined guide rail 43 (Fig. 3) that is attached to the inner edge of the key bed 14.

It will be observed that in the described construction of wippen actuating means, there is a mechanical advantage in the use of levers 35 of the second class, as a consequence of which the instrument may have a very light touch. Fig. 2 illustrates the positions of the hammer actuating parts when the key has been depressed to sound a note on the instrument.

As hereinbefore stated, where the inner edge portion of the key bed 14 is supported only at its ends, as has heretofore been the case in instruments of this type, there is a tendency of the key bed to sag, and this, of course, lowers the abstracts bodily and thus reduces the hammer stroke and the force of the blow. One object of this invention has been to eliminate this fault, and this is accomplished by a supporting device for the central portion of the inner edge of the key bed, of which in the described construction, the angle bar 22 forms an element.

Referring to Figs. 1 and 4, attached at its lower end to the under side of the horizontal limb of the angle bar 22 is an upright elbow bracket 44 that projects forwardly sufficiently to clear the abstracts 36 and levers 35. The upper end of this bracket underlies and supports the inner edge portion of the key bed 14, and to accurately level the key bed I preferably employ a wedge block 45 that is driven between the upper end of the bracket and the under side of the key bed until the latter is perfectly level, whereupon the bracket, wedge and key bed are united by screws 46.

From the foregoing it will be seen that the key bed and keys lie wholly forwardly of all parts of the action 29 and its supporting frame 28, 32; and that the action frame at its lower end is merely stepped on the supporting posts 27. As a result of this organization of the parts, by merely raising the lid or cover 16, removing the front panel 17, and retracting the screws 31, the entire action may be bodily lifted out of the case without any interference with the key bed or keys. Similarly, if it is necessary to remove or replace a broken or defective key, this can readily be done by merely removing the front panel 17 and without any interference with any part of the action. In all of the so-called "underslung" pianos of this type with which I am acquainted, parts of the action overhang the inner ends of the keys, thus making it very difficult to apply or remove a key without interference with the action.

It is believed that the foregoing description, in connection with the drawings, will make clear how the invention satisfactorily effectuates the stated purposes or objects thereof. And while I have illustrated one practical and satisfactory embodiment of the principle of the invention, I desire it to be understood that changes in the details of structure and arrangement may be resorted to within the purview and scope of the appended claims.

I claim:

1. In a piano of the type described, the combination with the string plate and strings, key bed and keys fulcrumed intermediate their ends, and an action including wippens located below the level of the keys, a wippen-actuating means comprising levers pivotally supported at their rear ends by the string plate beneath the wippens, tension abstracts directly suspended from the inner ends of the keys and connected at their lower ends to the forward ends of said levers, and wippen contact members carried by said levers located intermediate the ends thereof.

2. In a piano of the type described, the combination with the string plate and strings, key bed and keys fulcrumed intermediate their ends, and an action including wippens located below the level of the keys, of a horizontal rail supported between its ends by the string plate, and wippen-actuating means comprising levers pivoted at their rear ends on said rail beneath the wippens, wires directly suspended from the inner ends of the keys and connected at their lower ends to the forward ends of said levers, and wippen contact members carried by said levers located intermediate the ends thereof.

3. In a piano of the type described, the combination with the string plate and strings, key bed and keys fulcrumed intermediate their ends, and an action including wippens located below the level of the keys, of a horizontal rail supported between its ends by the string plate, and wippen-actuating means comprising levers pivoted at their rear ends on said rail beneath the wippens, wires directly suspended from the inner ends of the keys and connected at their lower ends to the forward ends of said levers, and wippen contact members on the upper sides of said levers located intermediate the ends thereof and nearest to the rear ends.

4. In a piano of the type described, the combination with the string plate and strings, key bed and keys fulcrumed intermediate their ends, and an action including wippens located below the level of the keys, of forwardly projecting arms on the string plate, a horizontal rail supported by said arms, and wippen-actuating means comprising levers pivoted at their rear ends on said rail beneath the wippens, abstracts directly suspended from the inner ends of the keys and connected at their lower ends to the forward ends of said levers, and wippen contact members carried by said levers.

5. In a piano of the type described, the combination with the string plate and strings, key bed and keys, and an action including wippens located below the level of the keys, of forwardly projecting arms on the string plate, a horizontal angle bar resting on and secured to said arms, a rail seated in said angle bar, and wippen-actuating means comprising levers pivoted at their rear ends on said rail beneath the wippens, abstracts suspended from the inner ends of the keys and pivoted at their lower ends to the forward

ends of said levers, and wippen contact members carried by said levers.

6. In a piano of the type described, the combination with the string plate and strings, key bed and keys, and an action including wippens located below the level of the keys, of a bracket supported by the string plate at a point beneath the action and having an upwardly extending portion underlying and supporting the rear edge of the key bed, and wippen-lifting means connected to and actuated by the inner ends of the keys.

7. In a piano of the type described, the combination with the string plate and strings, key bed and keys, and an action including wippens located below the level of the keys, of an upright elbow bracket supported at its lower end by the string plate at a point beneath the action and at its upper end underlying and supporting the rear edge of the key bed substantially centrally of the latter, and wippen-lifting means connected to and actuated by the inner ends of the keys.

8. In a piano of the type described, the combination with the string plate and strings, key bed and keys, and an action including wippens located below the level of the keys, of forwardly projecting arms on the string plate, a horizontal bar resting on and secured to said arms, an upright elbow bracket secured at its lower end to said bar at a point beneath the action and at its upper end underlying and supporting the rear edge of the key bed substantially centrally of the latter, and wippen-lifting means connected to and actuated by the inner ends of the keys.

9. In a piano of the type described, the combination with the string plate and strings, of an underslung action removably mounted on said string plate, levers pivotally supported by the string plate beneath the wippens and extending forwardly of said action, a key bed and keys fulcrumed intermediate their ends located opposite to and wholly forwardly of said action, and tension abstracts directly suspended from the inner ends of the keys and connected at their lower ends to the forward ends of said levers, whereby, by disconnecting the action from the string plate it may be bodily lifted out of the piano case without interference with the key bed or keys, and the keys may be applied and removed without interference with any part of the action.

10. In a piano of the type described, the combination with the string plate and strings, of forwardly extending arms on said string plate, a horizontal rail supported by said arms, action-supporting posts on said rail, an underslung action having its frame stepped on said posts and removably attached to said string plate, levers pivoted on said rail beneath the wippens and extending forwardly of said action, a key bed and keys located opposite to and wholly forwardly of said action, and abstracts suspended from the inner ends of the keys and connected at their lower ends to the forward ends of said levers, whereby, by disconnecting the action from the string plate it may be bodily lifted out of the piano case without interference with the key bed or keys, and the keys may be applied and removed without interference with any part of the action.

ALBERT A. HUSEBY.