April 7, 1942. R. J. LOHR 2,279,143

TOY PIANO

Filed Aug. 15, 1939

Fig. 1.

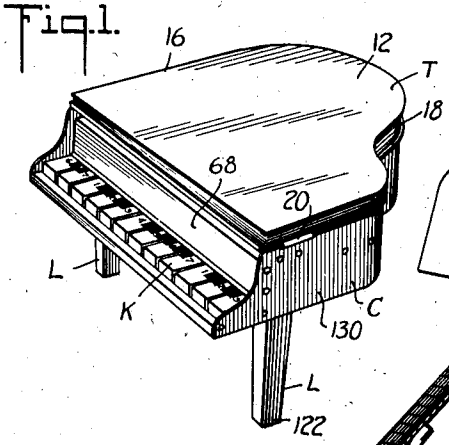


Fig. 2.

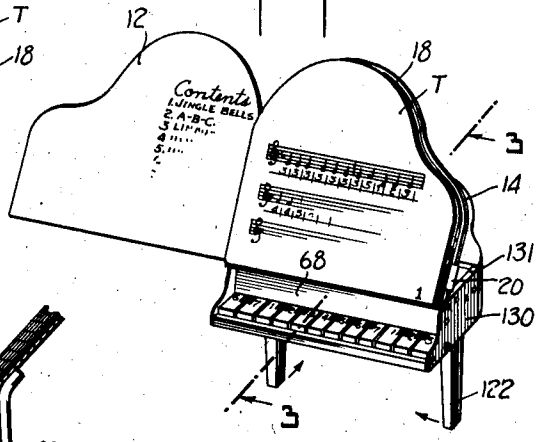


Fig. 3.

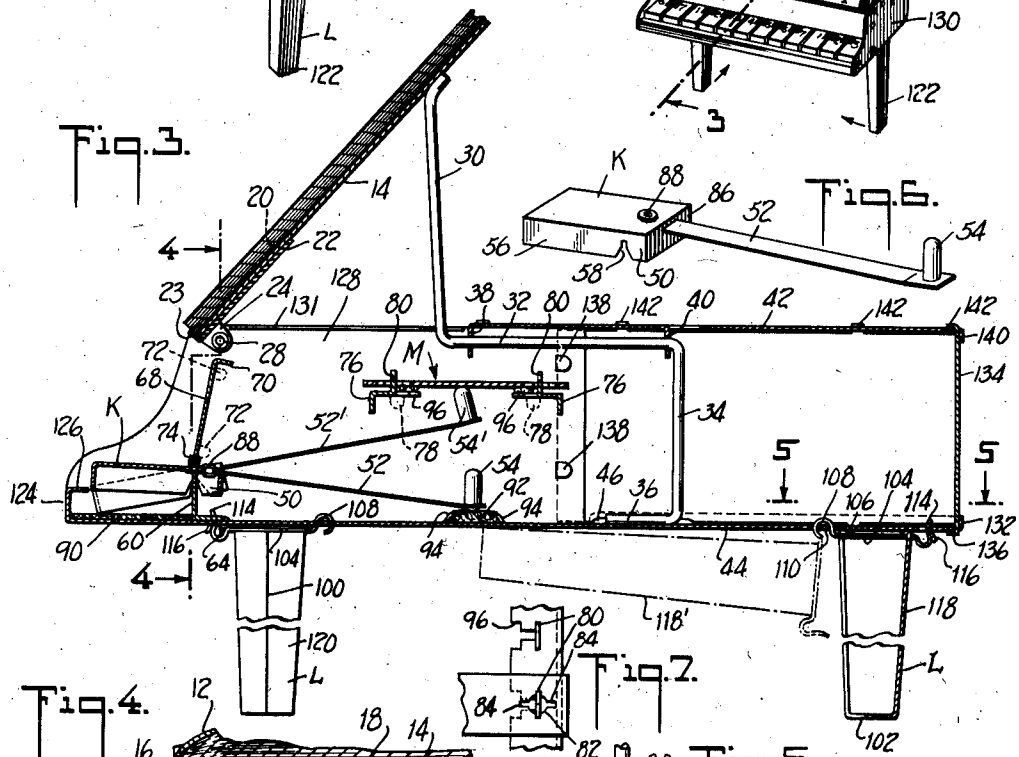
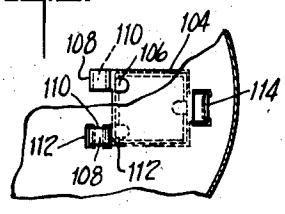


Fig. 6.

Fig. 7.

Fig. 4.

Fig. 5.



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TOY PIANO

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Application August 15, 1939, Serial No. 290,208

13 Claims. (Cl. 84—404)

This invention relates to toys, and particularly to toy pianos.

Toy pianos are already known in which keys are used to strike a xylophone having metallic sounding plates, perhaps more properly termed a metallophone. The primary object of my invention is to generally improve toy pianos of this character. A more particular object is to provide a toy piano which is made almost wholly of metal, but which sounds fully as good as, or even better than, a toy piano made of wood.

Another object of my invention is to provide an improved and greatly simplified "action" between the keys and the metallophone, this action being so simplified as to completely eliminate the usual intermediate levers, and the like. Still another object is to improve the pivoting of the keys, and to provide a frictionless and inexpensive mounting making it very easy to assemble the keys in the piano during manufacture. These objects all contribute to make possible low cost manufacture of the toy piano.

Another object of the invention is to provide the piano with a book-top preferably containing well known children's songs in simplified notation, the notes and keys preferably having corresponding numbers to facilitate playing of the piano by an untrained child. The book-top is a simulated piano top which may preferably be made to conform in outline to the configuration of the case of the piano, and which is pivoted so that it may be raised to a position which facilitates reading the music therein. The piano may also be provided with a pivotally mounted support which is adapted when in raised position to hold the book-top in its position of use, the arrangement being such that the support and the book-top may be folded down flat on top of the piano when not in use.

The book-top construction is not claimed herein, it being claimed in my co-pending divisional application Serial No. 398,766, filed June 19, 1941, and entitled "Toy piano."

To the accomplishment of the foregoing, and such other objects as will hereinafter appear, my invention consists in the toy piano elements and their relation one to the other, as hereinafter are more particularly described in the specification, and sought to be defined in the claims. The specification is accompanied by a drawing, in which:

Fig. 1 is a perspective view of the piano with the book-top in closed position;

Fig. 2 is a perspective view with the book-top in open position;

Fig. 3 is a section taken in elevation through the piano in the plane of the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary transverse section across the front of the piano taken in the plane of the line 4—4 of Fig. 3;

Fig. 5 is a horizontal section over the top of one of the folding piano legs, and is taken in the plane of the line 5—5 of Fig. 3;

Fig. 6 is a perspective view showing the construction of one of the keys with attached hammer; and

Fig. 7 is explanatory of a detail of the metallophone construction.

Referring to the drawing, and more particularly to Fig. 1, the piano, in the specific example here illustrated, simulates a grand or baby grand piano. It comprises a case C supported on legs L, and having a row of keys K at the front of the piano. The piano is provided with a top T which preferably conforms, in outline, to the configuration of the piano case. This top is, in reality, a book of music or songs. The top is pivoted at the front of the case and may be raised and supported in an angular position, such as that illustrated in Fig. 2. The book-top may then be opened to expose any one of the series of pages of music or songs therein.

Considering the construction in greater detail, and referring to the remaining figures of the drawing, the book-top comprises a front cover 12 and a back cover 14 which are preferably made of a single piece of cardboard folded at the middle to form a binding portion 16 at the left-hand edge of the book. A series of pages 18 are bound into the book, these preferably also being folded at the middle, and the assembly being stitched, stapled, or otherwise secured, in accordance with methods well known to binders. The book cover is free at the right-hand edge. The cover is slit at the binding for a short distance, thus also freeing the back cover at the lower end of the left-hand edge. These free edges are clamped by reversely folded flanges 20 at the ends of a mounting wall 22. The mounting wall extends across the piano from one side to the other, and may be a narrow strip, as shown, if the back cover 14 is stiff enough to be self-sustaining in shape. If the cover of the book is made of light material, the mounting wall 22 is preferably extended upwardly or widened to better support the book, and the left-hand edge of the book may be clamped at the top as well as at the bottom. The lower edge of mounting wall 22 is preferably flanged forwardly, as is indicated at 23, in order to provide a positive stop at the bottom edge of

the book. The ends of mounting wall **22** are provided with integrally formed bearing ears **24** which are turned downwardly and pivoted to the side walls of the piano case, as by means of the eyelets **28**. It will be evident that with this construction, the mounting wall **22**, and with it the book-top T, may be folded down flat on top of the piano case, as shown in Fig. 1, or may be turned upwardly, as is indicated in Fig. 2.

When the book-top is turned upwardly, it is supported in raised position, by means of a suitable top support. In the present case the support is a piece of wire **30**, which is extended horizontally rearwardly at **32**, then downwardly at **34**, and then again bent horizontally at **36**. The horizontal portion **32** acts as a pivot, it being received in a hole through a flange **38** on the top wall **42** of the piano case, and also being received in a bearing ear **40** which is struck downwardly from the top wall **42**. The portions **34** and **36** of support **30** are not essential, but are preferably added in order to provide detent means to hold the support **30** in upright position. Specifically, the part **36** bears against the bottom wall **44** of the piano case when the support **30** is in upright position. Referring to Fig. 4, it will be seen that bottom wall **44** is indented at **46** and **48** to form a detent which receives the part **36**. Inasmuch as the bottom **44** of the piano case is somewhat resilient, it yields downwardly when the part **36** is forced between the indentations **46** and **48**. It will be understood that the support **30** may be turned sidewardly to a horizontal position, the part **36** then being moved out of locking engagement with the bottom of the case and rising until it rests against the top wall **42**. At this time the support **30** is in horizontal position and lies below the level of top wall **42**, and therefore does not interfere with folding of the book-top flat against the top of the piano case.

The mechanism or "action" of the piano is extremely simple. The keys K are short and are pivoted near their rear ends. The short rearward extensions **50** (Figs. 3 and 6) of the keys have strips of material **52** secured thereto. The strips are preferably long, slender springs in strip or ribbon form, and each has a hammer head **54** at its rear end. The hammer head **54** is preferably made of a short piece of metal rod, the upper end of which is rounded, and the lower end of which is necked and riveted through a hole in the end of the spring. This provides a slightly weighty, upwardly directed hammer. The metallophone, generally designated M, extends across the piano from one side to the other and is disposed at a level higher than the row of keys K. The metallophone plates are located over the hammers, and it will be evident from inspection of Fig. 3, that on depressing any one of the keys the hammer **54** will be raised to strike the corresponding metallophone plate, as is indicated by the change in position from **52**, **54** to **52'**, **54'**. Because of the extremely light, springy nature of the springs **52**, there is no interference with proper vibration of the metallophone plate, even if the key is held in depressed position. The keys K are preferably formed of sheet metal. Each key is made of a single piece of sheet metal which is bent downwardly at its edges to form a hollow key which is open at the bottom. The side edges **56** (Fig. 6) are upwardly notched at **58** to fit over a fulcrum strip **60** (Fig. 3) which extends from one side of the piano to the other. The fulcrum strip **60** is preferably L-shaped in section, and is secured in position by tongue and slot connections **62** at its ends which pass through the side walls of the piano case. It may be, and preferably is additionally secured in position by a plurality of tongue and slot connections formed at the bottom of the piano case, one of these being indicated at **64** in Fig. 3.

The fulcrum strip **60** is preferably notched slightly along its upper edge, as is indicated at **66** in Fig. 4. These notches may be small, but are desirable to locate the keys against sideward movement and to space the same somewhat apart. The keys are held on the fulcrum strip by a retainer strip **68**, best shown in Fig. 3, the lower edge of said strip being disposed directly over the upper edge of fulcrum strip **60**. The upper edge of retainer strip **68** may be turned rearwardly at **70** to stiffen the same and to give the piano a more finished appearance. The retainer strip is secured in position by tongue and slot connections **72** at the ends of the piano, the tongues **72** passing through the side walls of the piano case. If desired, the lower edge of retainer strip **68** may be provided with a strip of cushioning material **74**, this preferably being a length of small diameter tubular material which is longitudinally slit to be received over the lower edge of the retainer strip. The material may be rubber coated fabric, such as the so-called "spaghetti" often used for electric insulating purposes.

The metallophone itself is generally conventional, but the manner in which the metallophone plates are supported deserves mention. The plates are supported on two diverging strips, as is conventional, but these strips are in the present case formed of sheet metal which is bent to L-shaped configuration with the horizontal part on top, as is best shown at **76** in Fig. 3. The ends of these strips are secured between the side walls of the piano case by appropriate tongue and slot connections **78**. A series of T-shaped lugs **80** are struck upwardly from the strips **76**, as is best shown in Figs. 3, 4 and 7. The T-shaped lugs **80** are received in holes **82** struck through the ends of the metallophone plates, these holes having slots **84** which are dimensioned to receive the T-shaped lugs **80**, but which are normally disposed perpendicular to the T-shaped lugs. Thus, the metallophone may be initially assembled by twisting the lugs **80**, following which the plates are held loosely, as they should be, but are incapable of falling out of position if the piano is turned upside down. The lugs need be twisted at only one end, for at the other end the entire plate may be orientated to receive the lug.

The forward ends of spring **52** are preferably secured to the keys in the following manner. The rear end wall **86** (Fig. 6) of each key is slotted to receive the spring **52**, and the top wall is perforated to receive an eyelet **88**. The end of the spring is passed through the slot into the hollow interior of the key, and is then eyeletted against the top wall of the key by means of the eyelet **88**.

Inasmuch as the piano is made entirely of sheet metal, it is desirable to provide several buffer strips made of fibrous material, such as fabric or felt. One such strip of material is indicated at **90** in Figs. 3 and 4, this strip extending beneath the keys and preventing any metallic sound resulting from the lower edge of the key striking the bottom of the piano. Another such strip is indicated at **92** in Figs. 3 and 4, this strip extending over the bottom of the piano beneath the hammer **54**. The strip is

held in place by a number of tongues **94** which are struck upwardly from the bottom **44** of the piano. Strip **92** acts as a cushion and sound absorbing medium to prevent any metallic sound when a piano key is released and the hammer falls against the bottom of the piano. Finally, strips **96** are preferably disposed on top of the metallophone supports **76**. These may consist merely of heavy strands of wool yarn which are run along the tops of the strips.

The legs L, of the piano, are preferably arranged to fold up against the bottom of the piano for more compact packaging, this being a matter of greater convenience during storage and shipment of the toy. Referring to Fig. 3, each leg is formed of a main piece of sheet metal which is longitudinally folded four times to form a hollow leg of square section. The seam, where the edges of the metal meet, is preferably disposed at the inside of the leg, as is indicated at **100** in Fig. 3. At its lower end, extensions of the metal are turned inwardly, as is indicated at **102** to partially close the bottom end of the leg. At its upper end the leg is secured to a small top plate **104**, the parts being attached by means of bent tongue and slot connections **106**. Top plate **104** is provided with a pair of extensions or tongues **108** (Fig. 5) which are bent or curled to form hinge sleeves. These are received on hinge pins **110** which are formed by providing the bottom **44** of the piano with a pair of closely adjacent collateral slots **112**. The material, between slots **112**, acts as the hinge pin **110**. At its opposite end the top plate **104** is provided with another extension or tongue **114** which is so shaped as to act as a spring detent. It cooperates with a guide lug **116** struck downwardly from the bottom **44** of the piano. It will be evident, on study of the drawing, that with this construction the legs may be folded inwardly from the solid line position to the broken line position **118'**.

The legs are preferably so mounted as to be folded in different directions. For example, the rear leg **118** may fold forwardly, as shown at **118'**, while the front legs may fold sidewardly inwardly toward one another. In the present case the rear leg **118** folds forwardly and the front leg **120** folds rearwardly, while the front leg **122** folds sidewardly, as is indicated by the arrow in Fig. 2. This folding of the legs in different direction is not at all essential, but is somewhat desirable in order to help add stability when the legs are in use. The legs, of course, clear one another when folded and thus minimize the size of the carton needed to box the piano.

The case of the piano may be assembled out of pieces of sheet metal patterned in a number of ways, but I prefer the method of assembly here illustrated. The bottom **44** is a single, large piece of sheet metal, the front edge of which is folded upwardly at **124** (Fig. 3) and rearwardly at **126** to form a suitable ledge at the keyboard. The bottom **44** is provided with extensions at its ends which are folded upwardly to form the straight side walls **128** and **139**. These are preferably turned inwardly at the top to form flanges **131**. The curved or contoured rear edge of bottom wall **44** is flanged upwardly for a short distance at **132**, as is shown in Fig. 3.

The rear wall of the piano consists of a separate strip of sheet metal **134** which is readily bent to the desired curved outline. It is secured to bottom wall **44** within flange **132** by appropriate bent tongue and slot connections, one of which is indicated at **136**. Its ends are secured to the side walls **128** and **130** by bent tongue and slot connections **138**. The case is completed by the top wall **42**, the curved periphery of which is downwardly flanged at **140**. The top wall is secured to the side wall **134** by bent tongue and slot connections **142**. The top wall **42** preferably terminates well behind the front edge of the piano in order to provide plenty of room for sound egress. In the present case, it terminates at the flange **38** which is disposed approximately over the middle of the metallophone. The key retaining strip **68**, which finishes the front of the piano case, has already been described.

It is believed that the construction and operation, as well as the many advantages of my improved toy piano will be apparent from the foregoing detailed description thereof. It will also be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention as sought to be defined in the following claims.

In the claims the term "metallophone" is intended to also include a xylophone and like equivalents. The reference in some claims to the piano case simulating a "baby grand piano" is intended to include a simulation of a grand piano and intermediate variations.

I claim:

1. A toy piano comprising a row of simulated piano keys, a metallophone extending across said piano, a slender spring wire secured directly to each key, a hammer head at the end of each spring wire, the parts being so arranged that depression of a key causes the hammer to strike a corresponding metallophone plate.

2. A toy piano comprising a case, a keyboard including a row of pivoted simulated piano keys at the front of said case, a metallophone extending across said piano from side to side at a level higher than the keyboard, a strip of material secured directly to and extending rearwardly from each key to a point beneath the metallophone, and a hammer head at the end of each strip, whereby depression of a key causes the hammer to rise and strike a corresponding metallophone plate.

3. A toy piano comprising a case simulating a baby grand piano, a keyboard including a row of pivoted simulated piano keys at the front of said case, a metallophone extending across said piano from side to side at a level higher than the keyboard, a slender leaf spring secured directly to and extending rearwardly from each key to a point beneath the metallophone, and an upwardly pointed metallic hammer head at the end of each spring, said spring and head constituting a hammer, whereby depression of a key causes the hammer to strike a corresponding metallophone plate, said key being restored by the weight of the hammer.

4. A toy piano comprising a row of simulated keys, a fulcrum strip for the keys extending from one side of the piano to the other, each key being notched upwardly to fit around the upper edge of the fulcrum strip, and a continuous retainer strip above the keys to hold the keys on the fulcrum strip.

5. A toy piano comprising a row of simulated keys, each key being a hollow sheet metal part which is open downwardly, a fulcrum strip for

the keys extending from one side of the piano to the other, the longitudinal or side walls of each key being notched upwardly to fit around the upper edge of the fulcrum strip, a retainer strip extending from one side of the piano to the other directly above said keys, said retainer strip functioning to hold the keys on the fulcrum strip.

6. A toy piano comprising a piano case, a keyboard at the front of the piano comprising a row of simulated keys, each key being a hollow sheet metal part which is open downwardly, a fulcrum strip for the keys extending from one side of the piano to the other, the longitudinal or side walls of each key being notched upwardly to fit around the upper edge of the fulcrum strip, the top edge of the fulcrum strip being notched to hold the keys against sideward movement, a retainer strip extending from one side of the piano to the other directly above said keys with its lower edge in substantially the same plane as the fulcrum strip, said retainer strip functioning to hold the keys on the fulcrum strip.

7. A toy piano comprising a piano case, a keyboard at the front of the piano comprising a row of simulated keys, a fulcrum strip for the keys extending from one side of the piano to the other, each key being notched upwardly to fit around the upper edge of the fulcrum strip, a retainer strip extending from one side of the piano to the other directly above said keys, said retainer strip functioning to hold the keys on the fulcrum strip, a metallophone extending across said piano from side to side at a level higher than the keyboard, a strip of material secured directly to and extending rearwardly from each key, and a hammer head on each strip, whereby depression of a key causes the hammer to strike a corresponding metallophone plate.

8. A toy piano comprising a piano case, a keyboard at the front of the piano comprising a row of simulated keys, each key being a hollow sheet metal part which is open downwardly, a fulcrum strip for the keys extending from one side of the piano to the other, the longitudinal or side walls of each key being notched upwardly to fit around the upper edge of the fulcrum strip, a retainer strip extending from one side of the piano to the other directly above said keys, said retainer strip functioning to hold the keys on the fulcrum strip, a metallophone extending across said piano from side to side at a level higher than the keyboard, a slender leaf spring secured to and extending rearwardly from each key to a point beneath the metallophone, and an upwardly pointed metallic hammer head at the end of each spring, said spring and head constituting a hammer, whereby depression of a key causes the hammer to strike a corresponding metallophone plate, said key being restored by the weight of the hammer.

9. A toy piano comprising a piano case made of sheet metal and simulating a baby grand piano, a metallophone extending across the inside of said case, a row of simulated piano keys with associated mechanism to strike the metallophone, said case comprising a single large piece of sheet metal bent upwardly and then rearwardly at the front edge to form a ledge at the keyboard, said piece having a narrow edge flange bent upwardly, a strip of sheet metal bent to form the rear edge of the case, and a cover wall secured at the top of said rear wall.

10. A toy piano comprising a piano case made of sheet metal, a metallophone support strip extending from one side wall to the other, said strip having a series of lugs struck upwardly therefrom, a series of metallophone plates extending across said strip and having holes which loosely receive said lugs.

11. A toy piano comprising a piano case made of sheet metal and simulating a baby grand piano, said case comprising a single large piece of sheet metal bent upwardly and then rearwardly at the front edge to form a ledge at the keyboard, a strip of sheet metal bent to form the rear edge of the case, a cover wall secured at the top of said rear, a fulcrum strip extending from one side wall to the other beneath the keys, a retainer strip extending from one side wall to the other above the keys and fulcrum strip, a metallophone support strip extending from one side wall to the other, said strip having a series of lugs struck upwardly therefrom, a series of metallophone plates extending across said strip and having holes which loosely receive the lugs.

12. A toy piano comprising a case simulating a baby grand piano, a keyboard including a row of pivoted simulated piano keys at the front of said case, a metallophone extending across said piano from side to side at a level higher than the keyboard, a strip of material secured directly to and extending rearwardly from each key to a point beneath the metallophone, and an upwardly pointed hammer head at the end of each strip, said strip and head constituting a hammer, whereby depression of a key causes the hammer to strike a corresponding metallophone plate, said key being restored by the weight of the hammer.

13. A toy piano comprising a piano case, a keyboard at the front of the piano comprising a row of simulated keys, each key being a hollow sheet metal part which is open downwardly, a fulcrum strip for the keys extending from one side of the piano to the other, the longitudinal or side walls of each key being notched upwardly to fit around the upper edge of the fulcrum strip, a retainer strip extending from one side of the piano to the other directly above said keys, said retainer strip functioning to hold the keys on the fulcrum strip, a metallophone extending across said piano from side to side at a level higher than the keyboard, a strip of material secured to and extending rearwardly from each key to a point beneath the metallophone, and an upwardly pointed hammer head at the end of each strip, said strip and head constituting a hammer, whereby depression of a key causes the hammer to strike a corresponding metallophone plate, said key being restored by the weight of the hammer.

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