

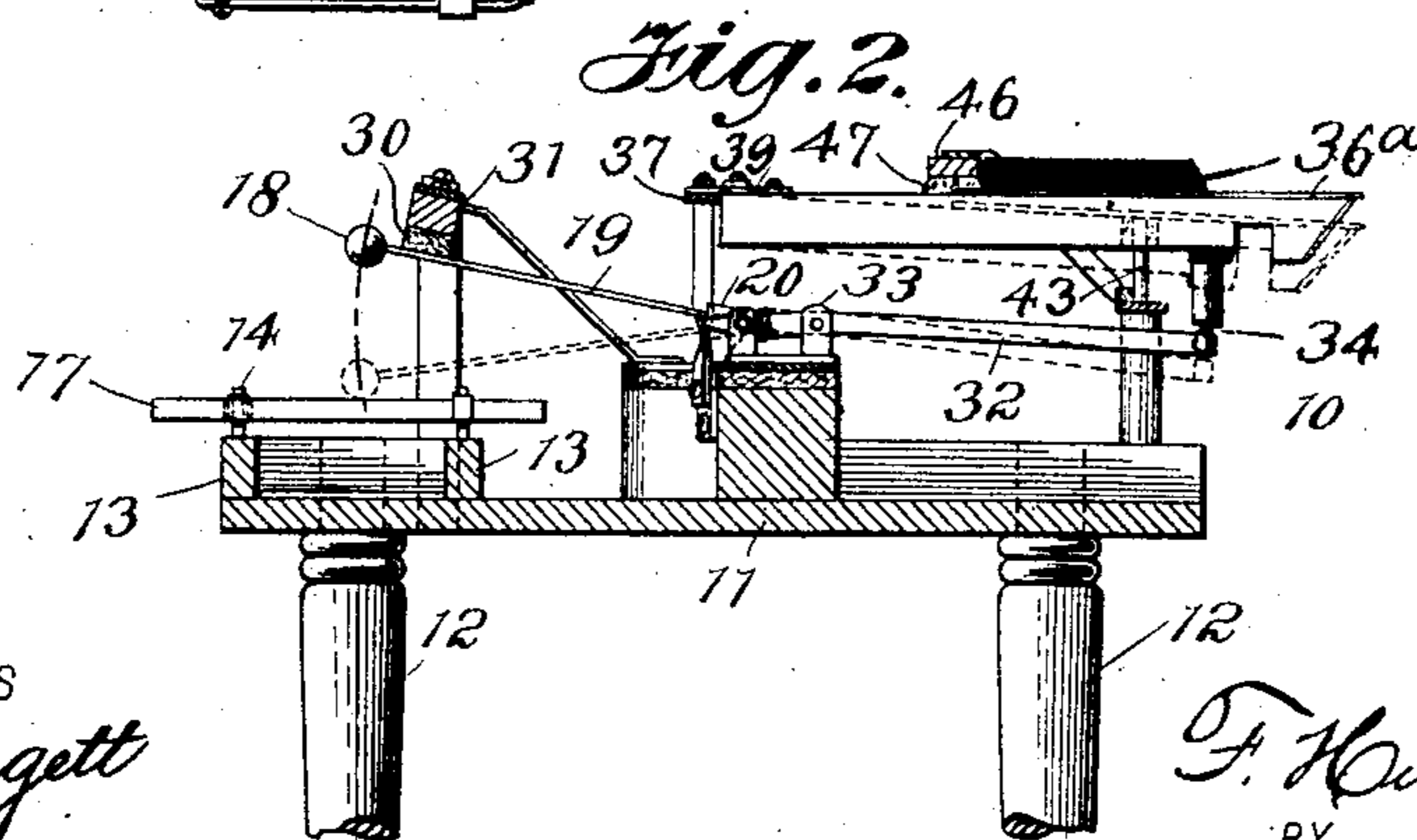
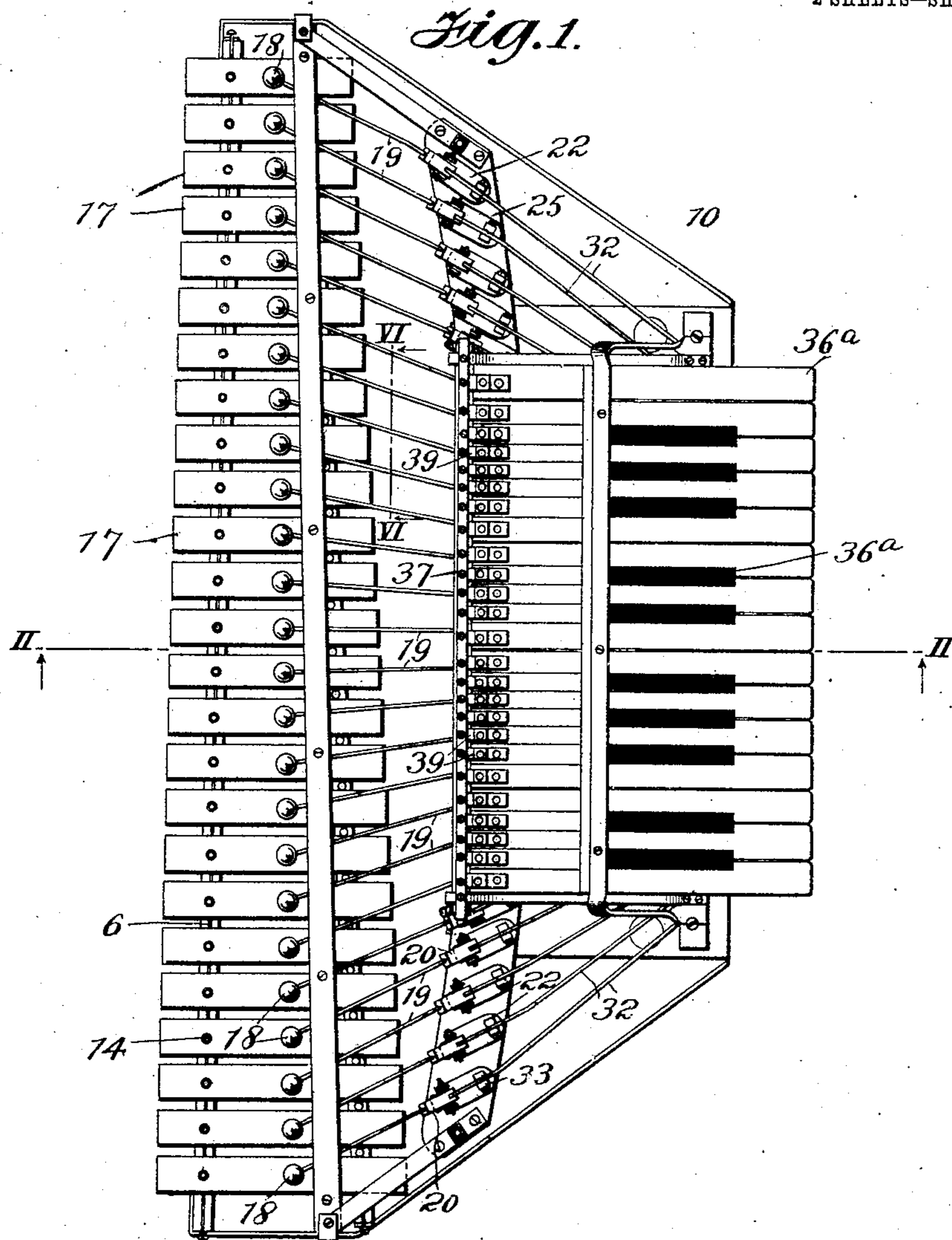
No. 855,056.

PATENTED MAY 28, 1907.

F. HIRSCHFELD.
BELL PIANO.

APPLICATION FILED JAN. 22, 1907.

2 SHEETS—SHEET 1.



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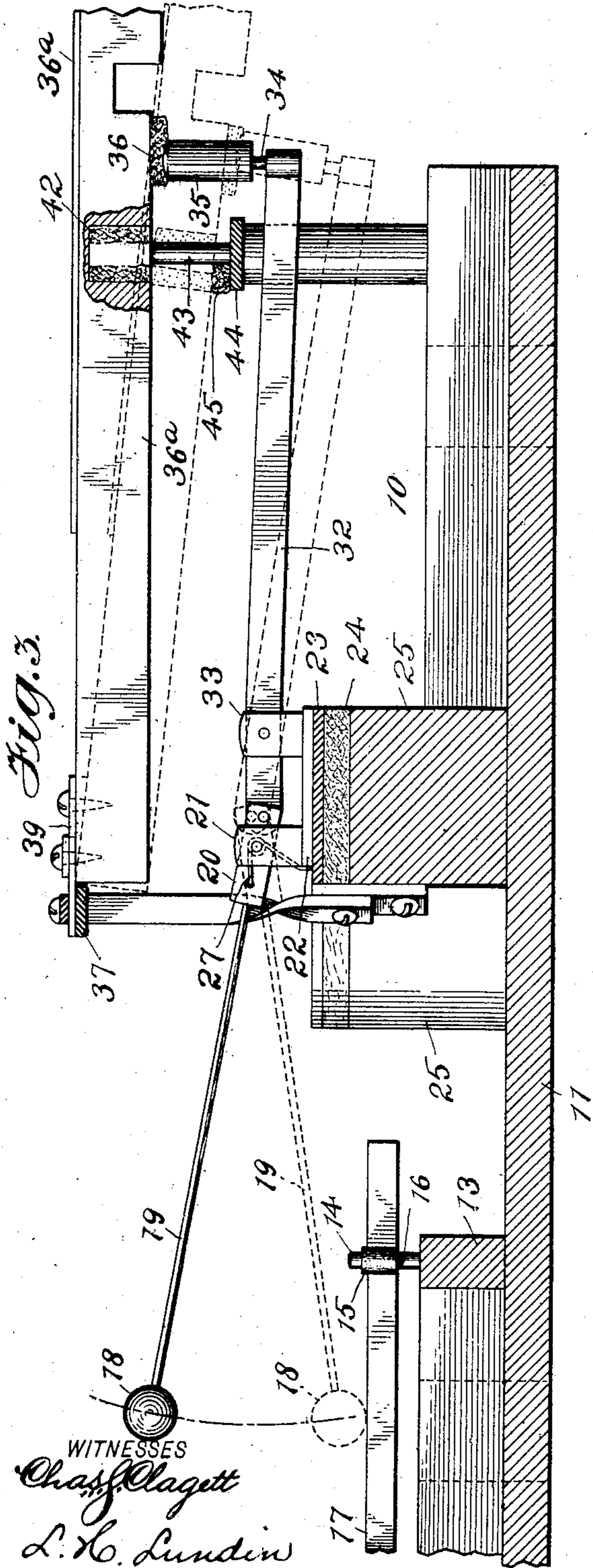


Fig. 4. Fig. 5. Fig. 6. Fig. 7.

Fig. 4 shows a perspective view of a bracket or support structure with a curved arm 27, a base 28, and a vertical support 29. A dashed line 26 indicates a pivot point or axis of rotation.

Fig. 5 is a cross-sectional view of a mechanical assembly. It shows a central shaft 19 passing through a housing 20. A nut 21 is threaded onto the shaft, and a washer 26 is positioned between the nut and the housing. A bolt 22 is used to secure the housing to a base 25. A spring 32 is shown coiled around the shaft, and a pin 33 is used to secure the spring.

Fig. 6 is a cross-sectional view of a mechanical assembly. It shows a central shaft 15 passing through a housing 14. A nut 16 is threaded onto the shaft, and a washer 17 is positioned between the nut and the housing. A bolt 18 is used to secure the housing to a base 19. A spring 20 is shown coiled around the shaft, and a pin 21 is used to secure the spring.

Fig. 7 is a cross-sectional view of a mechanical assembly. It shows a central shaft 22 passing through a housing 23. A nut 24 is threaded onto the shaft, and a washer 25 is positioned between the nut and the housing. A bolt 26 is used to secure the housing to a base 27. A spring 28 is shown coiled around the shaft, and a pin 29 is used to secure the spring.

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BELL-PIANO.

No. 855,056.

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To all whom it may concern:

Be it known that I, FRIEDRICH HIRSCHFELD, a citizen of the United States, and a resident of New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Bell-Pianos, of which the following is a full, clear, and exact description.

This invention relates more particularly to orchestral bell pianos in which the sounding elements may be played by the ordinary piano keyboard.

The primary object of the invention is to provide simple and efficient means whereby a plurality of bars or other sounding elements may be suitably supported, and so arranged that they may be played upon readily by those familiar with the ordinary piano keyboard; which is neat and attractive in appearance, and which is compact and so constructed that the parts may be readily assembled and repaired.

A further object of the invention is to provide simple and efficient means whereby the nature of the instrument may be changed by simply changing the nature of the sound-producing elements, and to so arrange the parts that the instrument may be more readily played than the usual devices intended to produce the same effect.

The invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a general plan view of one form of instrument embodying my invention. Fig. 2 is a vertical longitudinal section, partly in elevation, taken on the line II—II of Fig. 1. Fig. 3 is an enlarged vertical section, partly broken away and partly in section, showing more clearly the mechanical features of the invention. Fig. 4, is a detail of the spring employed for holding the hammer in a raised position. Fig. 5, is a fragmentary detail plan of the means for pivotally supporting the arms of the hammers. Fig. 6, is a fragmentary vertical section taken on the lines VI—VI of Fig. 1; and Fig. 7, is a detail plan of the spring hinge for the inner ends of the keys.

The frame 10 has a base 11 supported upon suitable legs 12, and there may be a casing, not shown, for inclosing the several parts of the instrument, all of which may be of any

suitable construction. To the base are secured the strips or bars 13, and projecting upward from the bars are posts 14 around each of which is a rubber washer 15. The posts are arranged in two rows transversely of the instrument, and each has an aperture through which passes an instrument string 16 made of gut or of any suitable material, and which is secured at its ends to the instrument frame. These strings are adapted to support the bells, bars or other sounding elements 17, and each element has an aperture therethrough, which is adapted to fit over the posts of one of the rows, and between the posts of the other row, so as to be normally sustained in a horizontal position.

For the purpose of producing sound, I arrange a hammer 18 or other striking device adjacent to the sounding elements 17. Each sounding element 17 has its individual hammer, and each hammer has its independent operating mechanism, which is substantially the same, and a description of one, therefore, will answer the description of all. As shown the hammer 18 is a metallic ball secured to one end of a rod 19, and the other end of said rod is held to a block 20, which is pivoted intermediate its ends between lugs or up-rights 21 forming a part of a bracket 22. This bracket is secured to a metallic plate 23, and under the metallic plate is a felt strip 24, which is held to a curved bar 25 forming a part of the frame. The lugs of the bracket form a fork so that the hammer block may be pivoted between the members thereof, and through the lugs and the hammer block passes a pivot bolt 26, which is securely fastened to the lugs. A spring 27, Figs. 3 and 4, is arranged to normally hold the hammer in a raised position, and this spring has its ends normally resting against the bracket, and has a spiral part 28 which fits around the pivot 26 and serves not only as a part of the spring proper, but also acts as a washer between the lugs of the bracket and the hammer block 20, and said spring has a U-shaped part 29 which passes through the hammer block, and serves to hold the hammer normally in a raised position. The hammer rod 19 in its raised position normally rests against the felt strip 30 which is secured to a bar 31, and this bar is supported by brackets or up-rights forming a part of the instrument frame.

As a means for operating the hammer to engage the sounding element, I provide a le-

ver 32, which lever is pivoted near its inner end to a boss 33 on the bracket 22, and has its inner end pivotally held to the hammer block 20. The outer end of each lever 32 is provided with a rod 34, and to the rod is secured a wooden or other device 35. This device or post 35 may be rounded at its upper end, and normally engages a piece of felt 36 under its respective key 36^a. There are a plurality of white and a plurality of black keys and a like number of sounding elements of different tones each acted on from a key indicating that particular note, the keys being arranged as in a piano keyboard. Each key is constructed at its outer or fingering part substantially the same as in the ordinary piano, and each key has its inner end pivotally and yieldingly held to a cross-bar 37, which is securely fastened by uprights to the curved bar 25 of the instrument frame. The outer end of each key is normally forced downward by the spring 39, Figs. 3 and 7, which has one end slotted, as at 40, so as to be adjustably held to the bar 37 at one end and is rigidly fastened by screws, or otherwise, at its other end to the key. Each key 36^a is provided with an opening, in which is a felt washer 42, and underneath the felt washer of each key is a post 43 which is adapted to enter the opening in the washer, and serves as a guide when the key is depressed. The posts 43 are secured to a transverse bar 44, and this bar is supported by uprights projecting upward from the instrument frame, and adjacent to the posts is a strip of felt 45 against which the keys are adapted to rest when they are depressed. The springs which hold the inner ends of the keys are comparatively light, and serve as hinges and normally force the outer ends downward, while the springs which force the hammers upward are stronger, and also normally force the outer ends of the levers with their projecting parts upward against the felt under the keys. A bar or plate 46 is arranged over the keys to limit their upward movement, and under the plate 46 is a strip of felt 47 to prevent noise by the impact of the keys against said bar. By this means each key and its hammer-operating mechanism are independent, but are so arranged that the connection while loose is practically a positive one, and the action of each hammer is very sensitive and the response immediate on any movement of its key.

While I have shown the sounding elements in the nature of bars of steel, it will be understood that the sounding elements may be of aluminium, wood or of any other material, and if of wood the effect of the ordinary xylophone may be secured. The hammers as well as other parts may also be of any suitable material and other changes may be made without departing from the character of the invention.

From the foregoing, it will be seen that several different instruments may be more readily and effectively played and with much less difficulty than is the case with the usual form of instruments producing the same sounds, and that any one who is able to play a piano may readily play the instrument as herein constructed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination with a plurality of black and white keys arranged as in the ordinary piano keyboard, of a plurality of sounding elements, a plurality of hammers adapted to engage the sounding elements, rods connected to the hammers, blocks carrying the rods, levers connected to the blocks, springs normally forcing the hammers and the outer ends of the levers upward, and spring hinges for forcing the keys to engage a part of the levers.

2. The combination with a plurality of black and white keys arranged as in the ordinary piano keyboard, of a plurality of sounding elements, a plurality of hammers adapted to engage the sounding elements, rods connected to the hammers, blocks carrying the rods, levers connected to the blocks, springs normally forcing the hammers and the outer ends of the levers upward, and spring hinges for forcing the keys so as to engage a part of the levers.

3. The combination with a plurality of keys each having a spring hinge connection at one end normally forcing the outer end of the key downward, of a plurality of sounding elements, hammers for engaging the elements to produce sound, together with mechanism connected with the sound producing means operatively and loosely engaging the keys near their fingering portions and adapted to be depressed by the movement of said keys.

4. The combination with a frame, of uprights or posts projecting from said frame, strings supported by the posts, sounding elements supported by the strings, hammers adapted to engage the sounding elements, rods connected to the hammers, pivoted blocks supporting the rods, springs for forcing the hammers upward, levers pivoted adjacent to the blocks and having one end connected to the hammer blocks and their outer ends provided with upright posts or engaging parts, a plurality of black and white keys, and a spring hinge yieldingly holding one end of each key to the frame and normally forcing the outer end of said key downward to engage the upright post of one of the levers.

5. The combination with a frame, of sounding elements supported on the frame, hammers adapted to engage the sounding elements, rods connected to the hammers, pivoted blocks supporting the rods, springs for forcing the hammers upward, levers pivoted

adjacent to the blocks and having one end connected to the hammer blocks and their outer ends provided with key-engaging parts, a plurality of black and white keys, a spring yieldingly holding one end of each key to the frame and normally forcing said key downward to engage one of the levers.

6. The combination with a frame, of sounding elements supported on the frame, hammers adapted to engage said elements, blocks supporting the hammers, means for forcing the hammers upward, levers pivoted adjacent to the blocks and having one end connected to said blocks, a plurality of black and white keys, and a spring yieldingly holding one end of each key to the frame and normally forcing the outer end of said key downward to engage the outer end of one of the levers.

7. The combination with a frame, of up-rights or parts projecting from said frame, strings supported by the posts, bars supported by the strings, hammers adapted to engage the bars, rods connected to the hammers, blocks supporting the rods, springs for forcing the hammers upward, levers pivoted adjacent to the blocks and having one end connected to the hammer blocks and their outer ends provided with posts or engaging parts, a plurality of black and white keys, and a spring hinge yieldingly holding one end of each key to the frame and normally forcing the outer end of said key downward to loosely engage the post of one of the levers.

8. The combination with a frame, of instrument strings supported by the frame, bars supported by strings, hammers adapted to engage the bars, blocks supporting the hammers, springs for forcing the hammers upward, levers connected to the hammer blocks, a plurality of black and white keys, and spring hinges yieldingly holding one end of the keys to the frame and normally forcing the outer ends of said keys downward to engage the levers.

9. The combination with a plurality of sounding elements, of a plurality of black and white keys, a hammer for each key, a block supporting each hammer, and means for pivotally supporting the block comprising a bracket, a bolt secured in said bracket, and a spring having a spiral part arranged around the bolt and serving as a washer between the bracket and the hammer block, said spring having parts engaging the hammer block and the bracket so as to force the hammer upward.

10. The combination with a frame, of a plurality of black and white keys arranged as in the ordinary piano keyboard and having their inner ends provided with a spring plate the forward end of which is slotted to permit adjustment of the keys and which normally force the outer ends of the keys downward, a plurality of sounding elements, and mechan-

ism operated by the keys when the latter are depressed to cause the elements to produce sound.

11. The combination with a support, of a plurality of white and black keys arranged as in an ordinary piano keyboard, a plurality of sounding bars each having an opening therein, posts projecting from the support and arranged in two rows one post of one of the rows entering the opening of each sounding bar and the posts of the other row being arranged between said bars, strings carried by the posts and serving to suspend the bars, a plurality of hammers one for each bar, and means operatively connected between the hammers and the keys whereby said hammers may be made to engage the bars.

12. The combination with a support, of a plurality of white and black keys arranged as in an ordinary piano keyboard, a plurality of sounding bars, posts projecting from the support in two rows and engaging said bars, strings carried by the posts by which the bars are suspended, a plurality of hammers one for each bar, and means operatively connected between the hammers and the keys whereby said hammers may be made to engage the bars.

13. The combination with a support, of a plurality of white and black keys arranged as in an ordinary piano keyboard, a plurality of sounding bars each having an opening therein, posts projecting from the support and entering the openings of the sounding bars, strings carried by the posts and suspending the bars, a plurality of hammers one for each bar, rods connected to the hammers, blocks to which the hammer rods are secured, brackets to which the blocks are pivoted, springs normally forcing the hammers upward and serving as washers between the blocks and the brackets, means against which the hammer rods may rest in their upward position, levers pivoted to the brackets and having one end connected to the blocks and their outer ends projecting upward under the fingering portion of the keys, guides for the keys, and a spring hinge for each key normally forcing the keys into engagement with parts of the levers.

14. The combination with a support, of a plurality of white and black keys arranged as in an ordinary piano keyboard, a plurality of sounding bars each having an opening therein, posts arranged in two rows projecting from the support one post of one of the rows entering the opening of one of the sounding bars, strings carried by the posts and suspending the bars, a plurality of hammers one for each bar, rods connected to the hammers, blocks to which the hammer rods are secured, brackets to which the blocks are pivoted, springs normally forcing the hammers upward, means against which the hammer rods may rest in their upward position, levers pivoted

to the brackets and having one end connect-
ed to the blocks and their outer ends project-
ing upward under the fingering portion of the
keys, and a spring for each key normally forc-
5 ing the keys into engagement with parts of
the levers.

15. The combination with a support, of a
plurality of white and black keys arranged as
in an ordinary piano keyboard, a plurality of
10 sounding bars, posts projecting from the sup-
port and engaging the sounding bars, strings
carried by the posts and suspending the bars,
a plurality of hammers one for each bar, rods
connected to the hammers, blocks to which

the hammer rods are secured, brackets to 15
which the blocks are pivoted, strings nor-
mally forcing the hammers upward and serv-
ing as washers between the blocks and the
brackets, and levers pivoted to the brackets
and having one end connected to the blocks 20
and their outer ends projecting upward under
and engaging the fingering portion of the keys.

This specification signed and witnessed
this twenty-first day of January A. D. 1907.

FRIEDRICH HIRSCHFELD.

Witnesses:

M. TURNER,

L. H. LUNDIN.