

No. 747,966.

PATENTED DEC. 29, 1903.

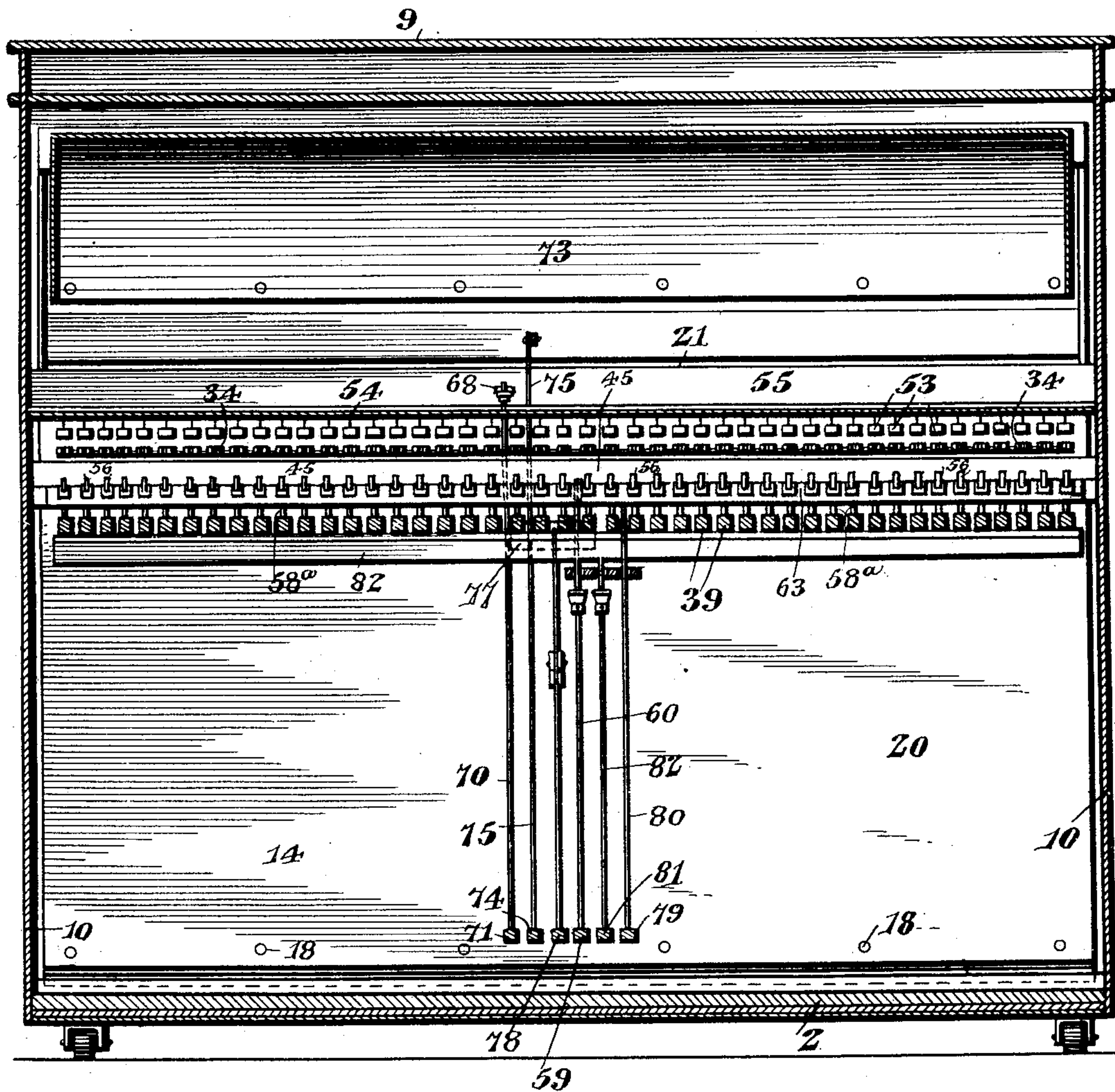
I. F. GILMORE.
WIRELESS PIANO.

APPLICATION FILED AUG. 18, 1902.

NO MODEL.

3 SHEETS—SHEET 1..

Fig.1.



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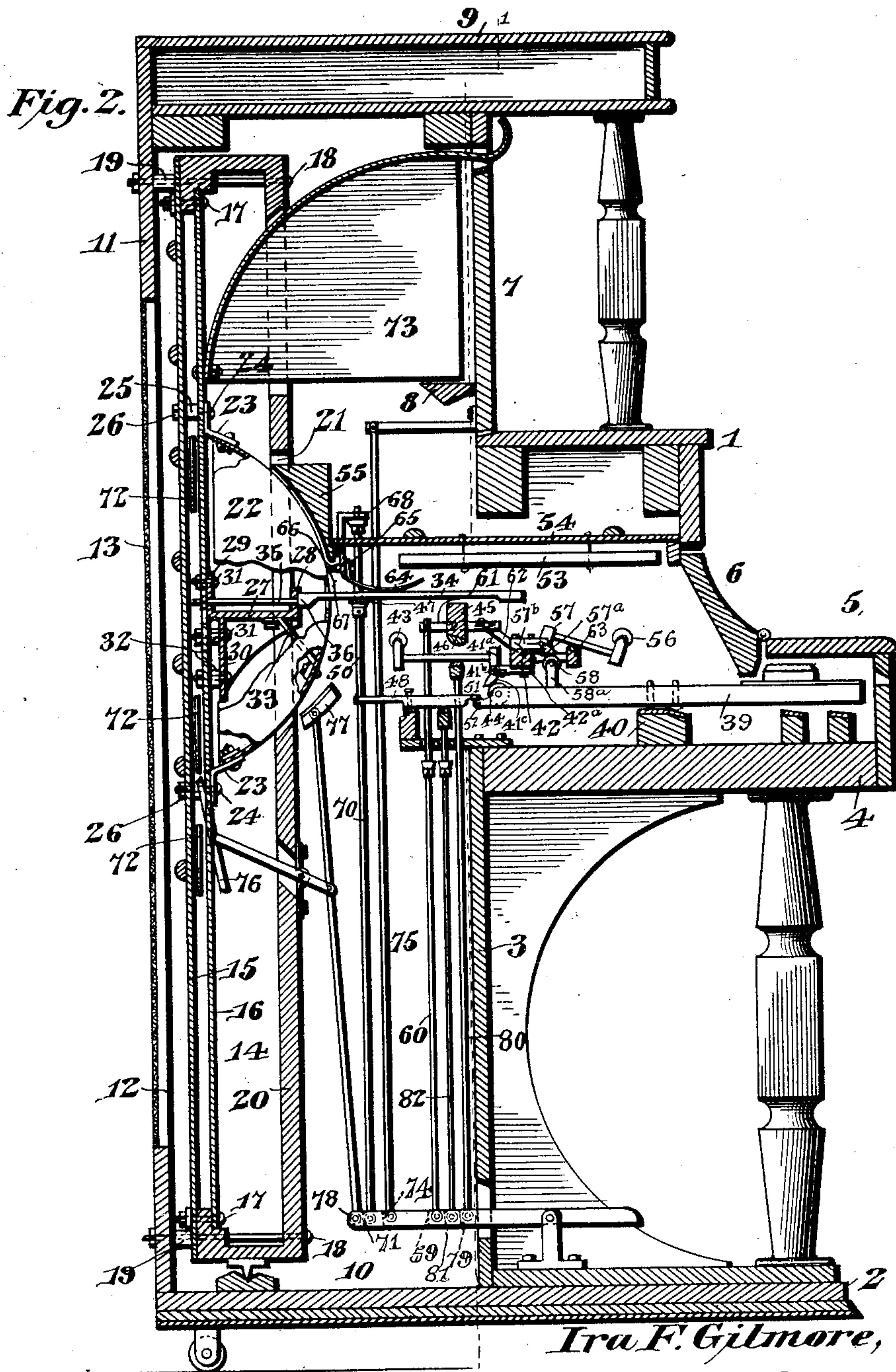
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3 SHEETS—SHEET 2.



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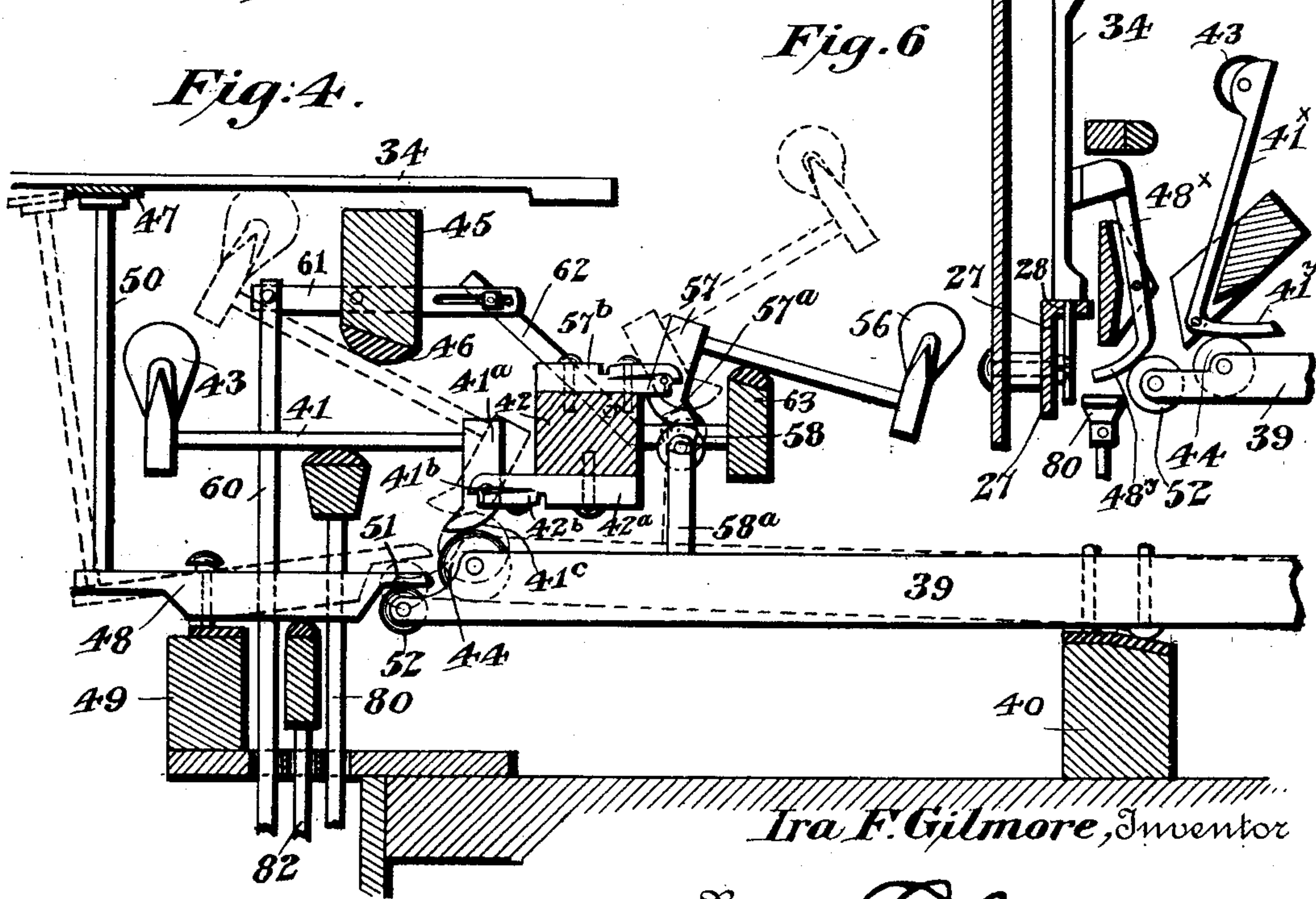
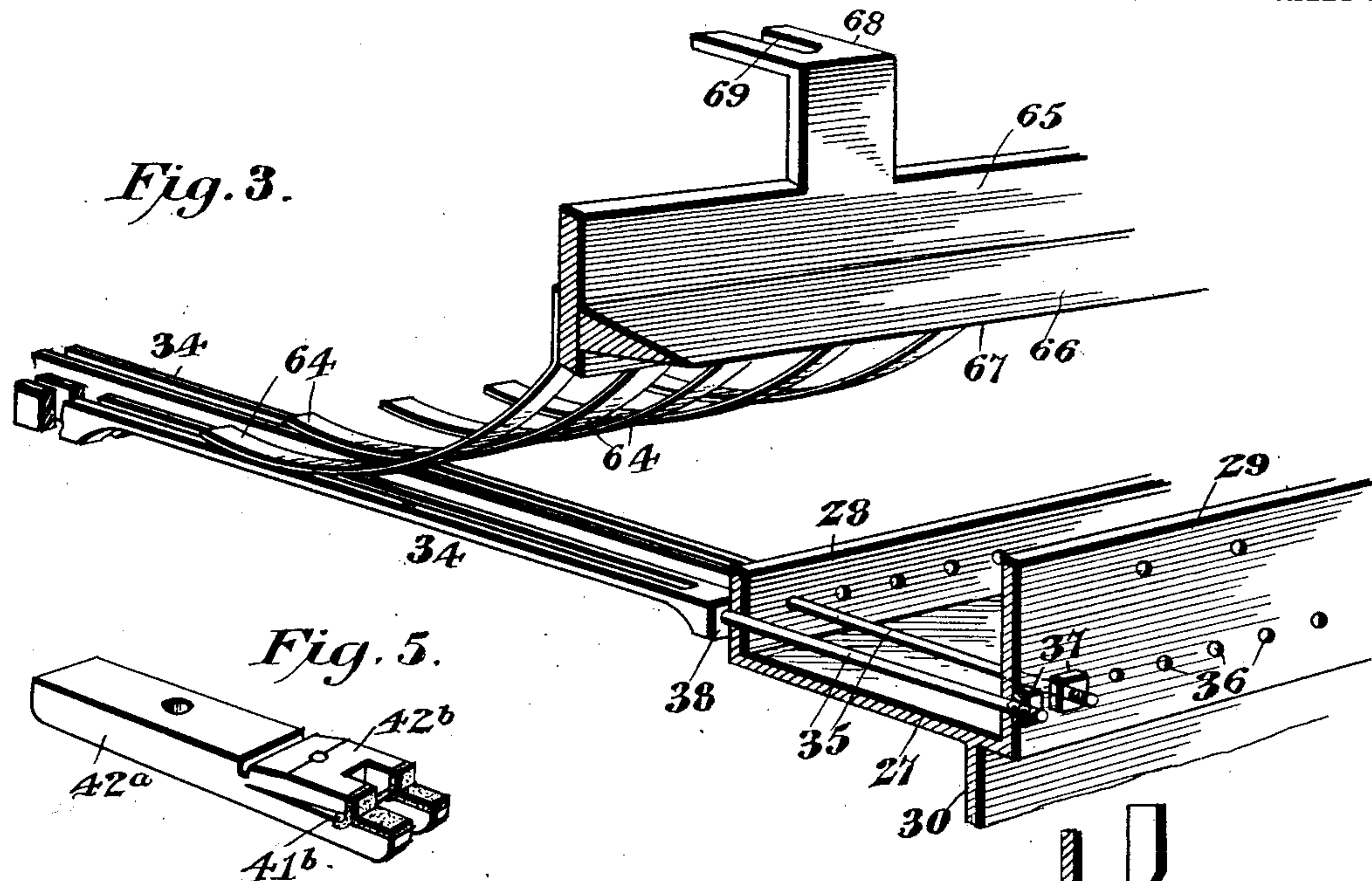
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

IRA F. GILMORE, OF BLOOMINGTON, ILLINOIS.

WIRELESS PIANO.

SPECIFICATION forming part of Letters Patent No. 747,966, dated December 29, 1903.

Application filed August 18, 1902. Serial No. 120,082. (No model.)

To all whom it may concern:

Be it known that I, IRA F. GILMORE, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented a new and useful Wireless Piano, of which the following is a specification.

My present invention relates to a novel wireless piano of that general type illustrated in my former patent, No. 699,848, dated May 13, 1902, and has for its object to simplify the construction and to secure a greater volume of sound and a better quality of tone than has heretofore been possible.

As distinguished from my former construction the present invention comprehends the employment of double reeds or forks vibrated by key-operated hammers associated with dampers which prevent the prolongation of the vibration, also a novel arrangement of the mandolin attachment, including a sound-conductor connected to the metal mandolin-strips and contacting with a sound-chamber to improve the tone, and a somewhat different arrangement of the xylophone-hammers and the means for throwing the xylophone into or out of operative relation with the piano-keys.

The invention also comprehends a novel arrangement of sounding-boards and the provision of foot-operated means for regulating the volume of sound and for bringing either the reeds, the xylophone attachment, or the mandolin, or any two or more of them, into action, as desired by the operator.

Other objects of the invention and subordinate features of construction will appear during the course of the following description of the illustrated embodiments of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of the piano complete. Fig. 2 is a vertical transverse section of the same. Fig. 3 is a sectional perspective view of the bridge and the mandolin attachment, showing the double reeds or forks attached to the bridge and contacting with the metallic mandolin-strips. Fig. 4 is a sectional elevation, on a somewhat-enlarged scale, showing the arrangement of the piano-action, the elevated positions of the hammers and the corresponding position of the damper

being shown in dotted lines. Fig. 5 is a detail view of one of the hammer-blocks, and Fig. 6 is a sectional elevation of a modified form of piano-action arranged for use in connection with vertically-disposed reeds or forks.

Like numerals of reference are employed to designate corresponding parts throughout the several views.

The piano-case 1 comprises the base 2, a front lower panel 3, a keyboard-support 4, a hinged key-cover 5, a hinged front 6, a sound-opening front 7, hinged to a cross-bar 8, a top 9, the end walls 10, and a back wall 11, having a large opening 12, closed by a fabric piece 13. The case constructed as thus described is shown in my former patent and constitutes no part of the present invention.

Disposed within the back part of the case is a sound-box 14, which instead of being composed of tilting sections, as in my former construction, is rigidly mounted and extends, substantially, from end to end of the case. The back wall of the sound-box 14 is formed by a wooden sounding-board 15, and within the box in spaced relation to the board 15 is a metallic sounding-board 16, the two boards being secured at their opposite ends to the box by bolts 17, which constitute securing devices common to both boards. The sound-box 14 is retained rigidly in place by bolts 18, passed through the box and the back wall 11 of the case, sleeves 19 being interposed between the box and the wall 11 to space the parts. The front wall 20 of the sound-box 14 is formed with an opening 21, through which projects the front portion of a semicylindrical sound-chamber 22, similar to that illustrated in my patent and extending substantially the full length of the box.

The chamber 22 has its rear edge spaced slightly from the sounding-board 16 and is secured thereto by angular brackets 23 and bolts 24, the latter being passed through the brackets and through the two sounding-boards and provided with spacing-collars 25 between the boards and with nuts 26, screwed upon the ends of the bolts, as shown. Within the sound-chamber 22 is located the reed or fork supporting bridge 27, disposed horizontally endwise of the chamber and having up-standing flanges 28 and 29 and a pendent

flange 30. The flange 28 is bolted directly to the sounding-board 16 by bolts 31, as shown, and the flange 30, disposed in a plane in advance of the flange 29, is likewise bolted to the board 16, but is spaced therefrom by interposed collars 32. The front edge of the bridge may be additionally supported by a brace 33, bolted at its lower end to the curved wall of the sound-chamber.

The bridge 27 is designed to constitute a support for the double reeds or forks 34, arranged in a horizontal series and projecting through and beyond the front wall of the sound-chamber from the bridge. Each of the forks is provided with a stem 35, extended through suitable coincident openings 36 in the flanges 28 and 29 and secured by terminal nuts 37, which draw the shoulders 38 of the forks tightly against the front flange 28 of the bridge.

The key-bars are supported, as usual, upon the key-rail 40; but instead of being in longitudinal coincidence with the forks are disposed with their rear ends below the same to permit the interposition of the piano-hammers 41. The piano-hammers are supported from the hammer-rail 42 and are provided with cushioned strikers 43 at their free ends. The manner of mounting the hammers is clearly shown in Fig. 4. To the under side of the rail 42 are screwed or otherwise secured a series of hammer-blocks 42^a, corresponding in number to the number of hammers employed. Each block 42^a is bifurcated to receive the foot 41^a of the adjacent hammer and is formed with an adjustable bearing-jaw 42^b, which, in conjunction with the rear end of the block, affords a bearing for a pintle 41^b, extending beyond opposite sides of the hammer-foot and constituting the axis of movement of the hammer. The hammer-feet are in the form of blocks disposed at right angles to the stems of the hammers, and each of said feet is extended below its supporting-block and is formed at its lower end with a curved contact-face 41^c, eccentric to the pintle 41^b. The hammers are normally disposed horizontally in that form of the invention illustrated in the first five figures of the drawings (see Figs. 2 and 4) and are arranged to be swung up by the key-bars to strike both legs of the forks. Each key-bar is provided adjacent to its rear end with a cushioned contact-roller 44, designed to contact with and roll upon the curved contact-face 41^c of the adjacent hammer-foot. The provision of these contact-rollers upon the key-bars is one of the novel features of the invention, and it will be noted that the employment of the rollers, in connection with the curved contact-faces of the hammer-feet, reduces to a minimum the friction incident to the movement of the parts, and also reduces to a like extent the wearing of the contacting surfaces, since the rotation of the rollers will serve to present a new contact-surface each time the hammers are operated. The return

of the hammers will be more or less prompt under the impulse of gravity; but in order to secure a quick return I mount upon the under side of a rail 45 a rubber or other suitable buffer strip 46, disposed to receive the impact of the hammers and effect their return.

The primary distinction between the present construction and that shown in the patent will now be apparent. I still eliminate the usual wires and employ reeds or forks in lieu thereof; but instead of arranging picking mechanism for vibrating the forks I employ a simple form of piano-action involving key-operated hammers, each of which strikes a sharp blow upon both legs of a fork to vibrate the latter, and thus produce a rich full tone. It is evident, however, that the vibration of each fork must be checked ordinarily to prevent undue continuation of the sound. I therefore provide for each of the forks a damper 47, (see Fig. 4,) comprising a contact-piece and a damper-bar 48, pivoted upon a rail or cross-timber 49 and having a vertical arm 50, at the upper end of which the contact-piece or damper proper is mounted. The damper-bars 48 are provided at their front ends with fingers 51, disposed over the terminal contact-rollers 52 of the key-bars. Thus it will be seen that normally the dampers are in engagement with the forks and that the hammers are out of engagement therewith. When, however, one of the piano-keys is depressed, it simultaneously operates a damper and a hammer, the former being drawn away from the fork and the latter striking the fork to vibrate the same. As soon as the key is released the hammer drops away from the fork and the damper contacts therewith to check the vibration.

In addition to the piano proper it is contemplated to equip the instrument with additional devices or attachments for securing a variety of musical effects. One of these is a xylophone, the bars 53 of which are located in a plane above the forks and are suspended from a horizontal sounding-board 54, extending lengthwise of the case and having its opposite edges supported by the front of said case and by a cross-timber 55, the latter being located adjacent to the front of the sound-box and corresponding generally to the timber 70 of the patented construction. The xylophone-bars are arranged over and designed to be struck by the xylophone-hammers 56, constructed substantially like the piano-hammers and likewise provided with feet 57, formed with curved contact-faces 57^a and swung in hammer-blocks 57^b, identical in construction with the blocks 42^a, but occupying reverse positions at the upper side of the rail 42. The curved faces 57^a of the hammer-feet 57 are disposed to be engaged by contact-rollers 58, journaled in uprights 58^a, extending from the key-bars 39 in advance of the rollers 44. Attention is called to the

fact that the hammer-rail 42 constitutes a common support for the piano and xylophone hammers, both of which are arranged for actuation by the piano-keys.

5 It is designed to throw the xylophone out of action by means of a xylophone-pedal 59, located adjacent to the base of the case. Said pedal is therefore connected, by means of a rod 60, with one end of a lever 61, fulcrumed
10 in the rail 45 (see Fig. 2) and having loose pivotal connection at its opposite end with one arm of a bell-crank lever 62, fulcrumed in the hammer-rail 42 and carrying a contact-bar 63, disposed when the pedal 59 is de-
15 pressed to engage the xylophone-hammers and move the same out of operative relation with the rollers 58 on the key-bars.

The other musical attachment is designed to give a mandolin effect, and it comprises a
20 series of curved mandolin-strips 64, of any suitable material, disposed to contact with the forks (see Fig. 3) and terminally secured to a bar 65, hinged to the lower edge of the timber 55 and formed with a rearwardly-extending sound-conductor 66, having a knife-edge
25 67, which when the attachment is in use bears against the front wall of the semicylindrical sound-chamber 22. The bar 65, constituting a rocking carrier for the mandolin-strips 64,
30 is provided at a point above its hinge with a forwardly-extending arm 68, provided with a slot 69 for the reception of the upper end of a vertical rod 70, connected at its lower end to what may be termed a "mandolin-pedal" 71.
35 By depressing the pedal 71 the bar 65 is rocked upon its hinge to elevate the strips 64 out of operative relation with the forks and the sound-conductor 66 is simultaneously removed from contact with the chamber 22.
40 Normally, however, the parts assume the positions shown in Fig. 2. I prefer also to employ sympathetic sounders in the form of coil-bells 72, located intermediate of the sound-
45 ing-boards 15 and 16 and preferably carried by the former, as shown. It is also desirable to employ a sound-conductor 73, secured to the sounding-board 16 and extending forwardly through the front wall of the sound-
50 box 14 into close proximity to the sound-opening front 7, which latter is operated by a pedal 74 and an intermediate connecting-rod, as usual. I also employ, as in my former construction, muffling-boards 76 and 77,
55 operated by a muffling-pedal 78 and designed, respectively, to contact with the sounding-board 15 and with the chamber 22.

We have now seen that the piano may be operated with or without the xylophone and mandolin attachments and that the volume
60 may be increased or diminished by the manipulation of the sound-opening front or the muffling-boards. It is also desirable to operate the xylophone attachment alone, and for this reason it becomes necessary to provide pedal-operated means for moving the
65 piano hammers and dampers to inoperative positions, so that the forks will not be vibrated

when the piano-keys are moved to operate the xylophone. The desired result may be accomplished by providing a hammer-pedal 70
79, connected to a rod 80, disposed to elevate the hammers and retain the same in inoperative positions, and a damper-pedal 81, having
75 a rod 82, disposed to elevate the front ends of the damper-bars 48 to hold said bars out of contact with the rear ends of the key-bars while the xylophone is in use. The damper-
80 pedal 81 may also be employed to hold the dampers out of engagement with the forks when the latter are vibrated, provided the prolongation of the tones is desired.

In Fig. 6 I have shown a slightly-modified construction for adapting the piano-action to vertically-disposed forks. In large
85 instruments the forks or reeds will be of considerable length, and in order to retain the desirable upright form of the case the vertical disposition of the forks is necessary. The modification of the action therefore compre-
90 hends hammers 41^x, having curved feet 41^y, designed to be engaged by the contact-rollers 44. The damper-arms 48^x are pivotally supported in rear of the hammers and are provided with angular tailpieces 48^y, disposed to be engaged by the rollers 52. 95

In order that the terms employed in the claims may be properly defined, attention is directed to the fact that the forks and the means for vibrating the same constitute the primary organization of the piano. I
100 shall therefore designate the hammers 43 as "piano-hammers" and will apply the term "piano-action" to said hammers and the associated parts for operating them.

It will be seen from the foregoing that I
105 have produced a wireless piano which when once properly adjusted will not require tuning as long as the instrument is fit for use and which will produce a variety of musical effects, adapting it to various tastes; but
110 while the illustrated embodiments of the invention are thought at this time to be preferable I reserve to myself the right to effect such changes, modifications, and variations of the illustrated structure as may be fairly
115 embraced within the scope of the protection prayed.

What I claim is—

1. In a wireless piano, the combination with a case, of a series of forks, hammers arranged
120 to strike both legs of the forks, and means for operating the hammers.

2. In a wireless piano, the combination with a case, of a horizontal series of forks each having both legs disposed in the same plane, a
125 corresponding series of hammers each arranged to contact simultaneously with both legs of a fork, and keys for operating the hammers.

3. In a wireless piano, the combination with
130 a case, of a series of forks therein, hammers and dampers arranged to contact with both legs of the forks, and means for operating the hammers and dampers simultaneously.

4. In a wireless piano, the combination with a case, of a series of forks having both legs disposed in the same plane, a corresponding series of hammers arranged to contact simultaneously with both legs of the forks, dampers also arranged for contact with both legs of the forks, and keys for operating the hammers and dampers. 70
5. In a piano, the combination with a hammer and damper, of a key provided with contact-rollers arranged to engage the hammer and damper, respectively. 75
6. In a wireless piano, the combination with a series of forks, of pivoted hammers arranged to strike both legs of the forks, and keys having contact-rollers arranged to engage the hammers. 80
7. In a wireless piano, the combination with a fork, of a key provided with a pair of contact-rollers, a pivoted hammer and a pivoted damper each arranged to contact with both legs of the fork and disposed to be engaged by the rollers when the key is operated. 85
8. In a wireless piano, the combination with forks and xylophone-bars, of xylophone-hammers and piano-hammers arranged to strike the bars and forks respectively, a single hammer-rail supporting both sets of hammers, and operating-keys, each of which is common to a pair of hammers. 90
9. In a wireless piano, the combination with a case, a sounding-board therein, and xylophone-bars suspended from the sounding-board, of a hammer-rail mounted in the case, a series of xylophone-hammers carried by the hammer-rail, keys for operating the hammers, a bell-crank lever supported upon the hammer-rail and having a contact-bar arranged to engage the several xylophone-hammers to throw the latter to an inoperative position, a pedal, and operative connections intermediate of the pedal and lever. 95
10. In a wireless piano, the combination with the forks, hammers therefor, keys for operating the hammers, xylophone-bars, and xylophone-hammers arranged to strike the bars and also operated by the keys, of a rail provided with a buffer to effect the prompt return of the piano-hammers, a lever fulcrumed on said rail, a pedal having connection with said lever, and a bell-crank lever having connection with the first-named lever and provided with a contact-bar arranged to move the xylophone-hammers to an inoperative position when the pedal is depressed. 100
11. In a wireless piano, the combination with the forks, xylophone-bars, and keys, of a hammer-rail, piano-hammers and xylophone-hammers mounted on said rail and disposed for actuation by the keys, a buffer-rail provided with a buffer to effect the prompt return of the hammers, a lever carried by the buffer-rail, means for operating said lever, and means connected to said lever for moving the xylophone-hammers to an inoperative position. 105
12. In a wireless piano, the combination with a case, of a series of forks therein, key-operated hammers for vibrating the forks, a series of mandolin-strips each of which is disposed to engage both legs of a fork, and means for moving said strips into and out of engagement with the forks. 110
13. In a wireless piano, the combination with a case, of a series of forks therein, key-operated hammers arranged to strike both legs of the forks, a series of mandolin-strips arranged to engage the forks at the sides thereof opposite the hammers, a rocking bar carrying said strips, and means for rocking the bar to present the strips into or out of engagement with the forks. 115
14. In a wireless piano, the combination with a case, of a sound-chamber therein, a series of forks, means for operating the forks, a bar provided with a sound-conductor engaging the sound-chamber, and a series of mandolin-strips extending from the bar and disposed to engage the forks. 120
15. In a wireless piano, the combination with a case, and a sound-chamber, of a series of forks extending therefrom, a rocking bar provided with a sound-conductor disposed to contact with one wall of the sound-chamber, a series of mandolin-strips carried by the bar and arranged to engage the forks, and means for moving the bar to move the strips and sound-conductor out of contact with the forks and sound-chamber, respectively. 125
16. In a wireless piano, the combination with a sound-chamber, and a series of forks extending therefrom, of a rocking bar having a sound-conductor disposed to contact with one wall of the sound-chamber, and also having a series of mandolin-strips disposed to rest upon the forks to produce a mandolin effect, a pedal, and an operative connection between the pedal and the rocking bar. 130
17. In a wireless piano, the combination with a sound-chamber, and a series of forks extending therefrom, of a bar having a sound-conductor formed with a knife-edge resting against one wall of the sound-chamber, and a series of mandolin-strips carried by the bar and disposed to rest upon the forks. 135
18. In a wireless piano, the combination with a series of forks, of a series of hammers each arranged to strike both legs of a fork, and a series of mandolin-strips supported at one end only and each arranged to contact with both legs of a fork. 140
19. In a wireless piano, the combination with a sound-chamber, a series of forks extending therefrom, a series of xylophone-bars, and a series of mandolin-strips, the latter being disposed for contact with the forks, of piano-hammers arranged to strike both legs of the forks, xylophone-hammers arranged to strike the xylophone-bars, one set of keys for operating both sets of hammers, and means for moving either set of hammers or the mandolin-strips to inoperative positions, whereby the musical effect may be varied. 145
20. In a wireless piano, the combination

with a series of forks, a series of xylophone-bars, and a series of mandolin-strips, the latter being disposed for contact with the forks, of piano-hammers and xylophone-hammers, the piano-hammers being arranged to strike both legs of the forks, keys for operating both sets of hammers, and foot-operated means for throwing either set of hammers or the mandolin-strips out of operation.

21. In a wireless piano, the combination with a case, of a sound-box therein, a sounding-board constituting the rear wall of the box, a second sounding-board located within the box, a series of forks extending from the second sounding-board through the front wall of the box, and means for vibrating the forks.

22. In a wireless piano, the combination with a case, of a sound-box therein, a sounding-board constituting the rear wall of the box, a second sounding-board spaced from the first-named board, a bridge supported by the second sounding-board, forks extending forwardly from the bridge, and means for vibrating the forks.

23. In a wireless piano, the combination with a case, of a sound-box therein, a sounding-board constituting the rear wall of the box, a second sounding-board located within the box, a semicylindrical sound-chamber having its open side opposed to the second sounding-board, a series of forks having their rear ends disposed within the sound-chamber, and means exterior to the sound-chamber for vibrating the forks.

24. In a wireless piano, the combination with a case, of a sound-box therein, a sounding-board constituting the rear wall of the sound-box, a second sounding-board located within the box parallel with the first-named board, a bridge carried by the second sounding-board, a series of forks extending forwardly from the bridge, a semicylindrical sound-chamber carried by the second sounding-board and inclosing the bridge, and means for vibrating the forks.

25. In a wireless piano, the combination with a case, of a pair of parallel sounding-boards therein, forks extending from one of the sounding-boards, means for vibrating the forks, and sympathetic devices mounted intermediate of the sounding-boards.

26. In a wireless piano, the combination with a case, of a sound-box therein, a sounding-board constituting the rear wall of the box, a second sounding-board located within the box parallel to the first-named board, sympathetic devices mounted between the two boards, forks extending forwardly from the second sounding-board, and means for vibrating the forks.

27. In a wireless piano, the combination with a case, of a sound-box therein, a pair of parallel sounding-boards located at the rear side of the box, sympathetic devices mounted between the sounding-boards, forks extending forwardly from one of the sounding-

boards, a semicylindrical sound-chamber carried by one of the sounding-boards and inclosing the rear ends of the forks, and means for vibrating the forks.

28. In a wireless piano, the combination with a case, of a pair of parallel sounding-boards therein, a series of forks extending forwardly from one of the sounding-boards, a semicylindrical sound-chamber inclosing the rear ends of the forks, a bar having a sound-conductor contacting with the semicylindrical sound-chamber, and also having a series of mandolin-strips disposed to engage the forks, and key-operated hammers for vibrating the forks.

29. In a wireless piano, the combination with a case, of a sound-box therein, a pair of parallel sounding-boards located at the rear side of the box, a series of forks, and a semicylindrical sound-chamber carried by one of the sounding-boards, said chamber inclosing the rear ends of the forks, a rocking bar having a sound-conductor resting against the semicylindrical sound-chamber, and also having a series of mandolin-strips disposed to engage the forks, and key-operated hammers for vibrating said forks.

30. In a wireless piano, the combination with a case, of a sounding-board therein, a bridge carried by the sounding-board and having upstanding flanges, a series of forks having stems secured in the flanges, and means for vibrating the forks.

31. In a wireless piano, the combination with a case, of a sounding-board therein, a bridge having upstanding flanges, one of which is secured directly to the sounding-board, a series of forks having stems secured in the upstanding flanges of the bridge, a pendent flange constituting a part of the bridge and having connection with the sounding-board, but spaced therefrom, and means for vibrating the forks.

32. In a wireless piano, the combination with a case, of a sounding-board therein, a bridge carried by the sounding-board and having upstanding flanges provided with coincident openings, forks provided with reduced stems passed through the openings in the flanges, and nuts screwed upon the ends of the stems to retain the forks rigidly in place.

33. In a wireless piano, the combination with a case, of a sound-box therein having a sounding-board constituting the rear wall thereof, a second sounding-board located within the box, a sound-conductor carried by said board and extended from the front of the box, a series of forks, and means for vibrating the forks.

34. In a wireless piano, the combination with a case, of a sound-box located therein, a pair of parallel sounding-boards located at the rear side of the box, a sound-conductor and a semicylindrical sound-chamber both carried by one of the sounding-boards and extended through the front of the sound-box, a series of forks having their rear ends in-

closed by the sound-chamber, means for vibrating the forks, and sympathetic devices located between the sounding-boards.

35. In a wireless piano, the combination with the forks, and xylophone-bars, of piano-hammers and xylophone-hammers, keys, and contact-rollers carried by the keys and disposed to engage and operate both sets of hammers.

36. In a piano, the combination with a key, of a plurality of hammers, and a plurality of contact-rollers carried by the key to engage and operate the hammers.

37. In a piano, the combination with a pair of hammers each having a foot formed with a curved contact-face, of a key provided with contact-rollers disposed to engage the contact-faces of both hammers.

38. In a wireless piano, the combination with a fork, a xylophone-bar, a piano-hammer, a xylophone-hammer, and a damper disposed to engage the fork, of a key having a

plurality of contact-rollers arranged to operatively connect the key with both hammers and the damper when the key is depressed. 25

39. In a wireless piano, the combination with a fork, of a pivoted hammer and an independently-pivoted damper, said damper being normally in engagement with the fork, and a key provided with a pair of contact-rollers located adjacent to one end of the key and disposed to engage the hammer and damper, respectively, to withdraw the damper from the fork and to move the hammer into engagement with said fork when the key is depressed. 30 35

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

IRA F. GILMORE.

Witnesses:

JACOB KOPP,
HOMER K. HUSTON.