

No. 690,463.

Patented Jan. 7, 1902.

F. A. PORTER.
STRINGED MUSICAL INSTRUMENT.

(Application filed July 21, 1900.)

(No Model.)

Fig. 1.

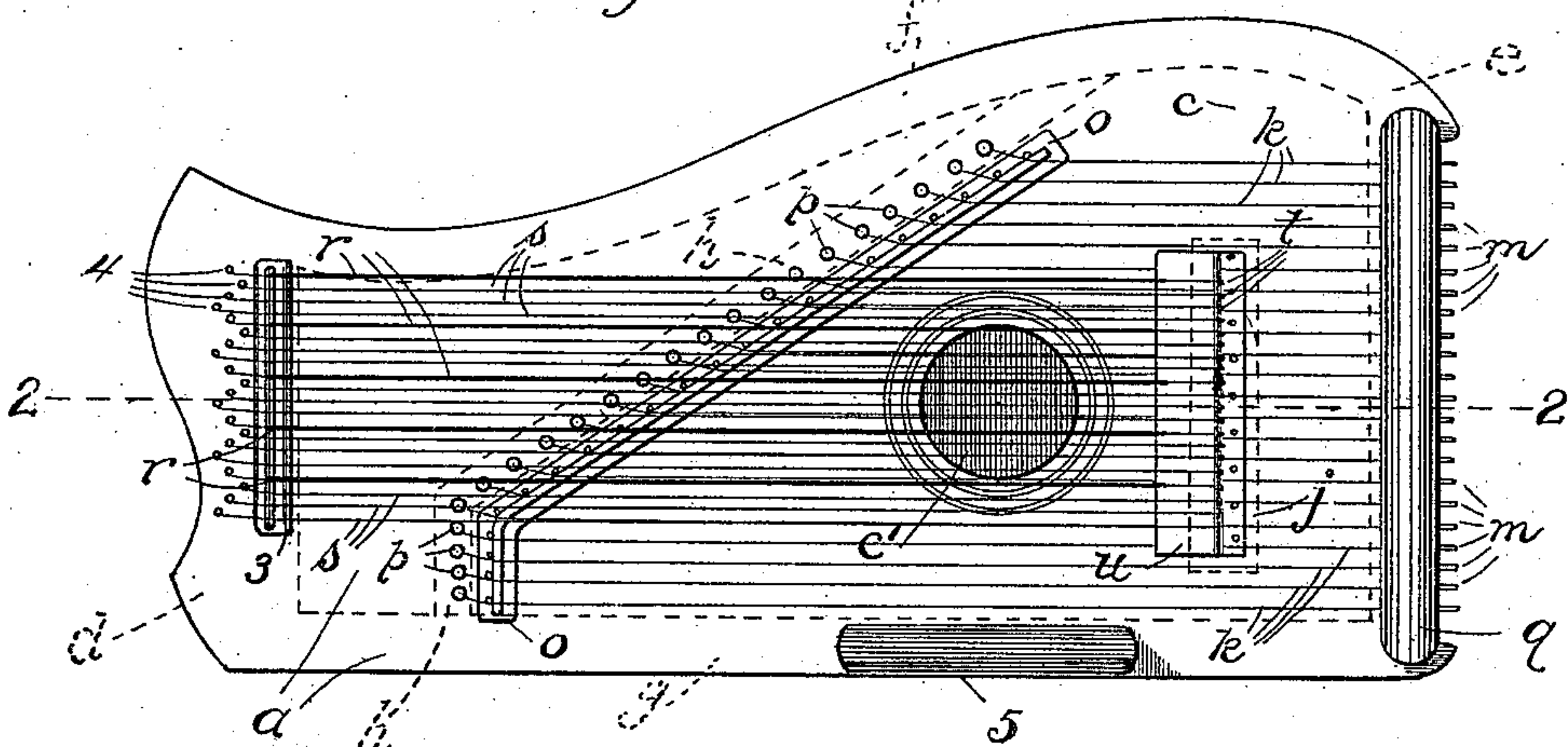


Fig. 2.

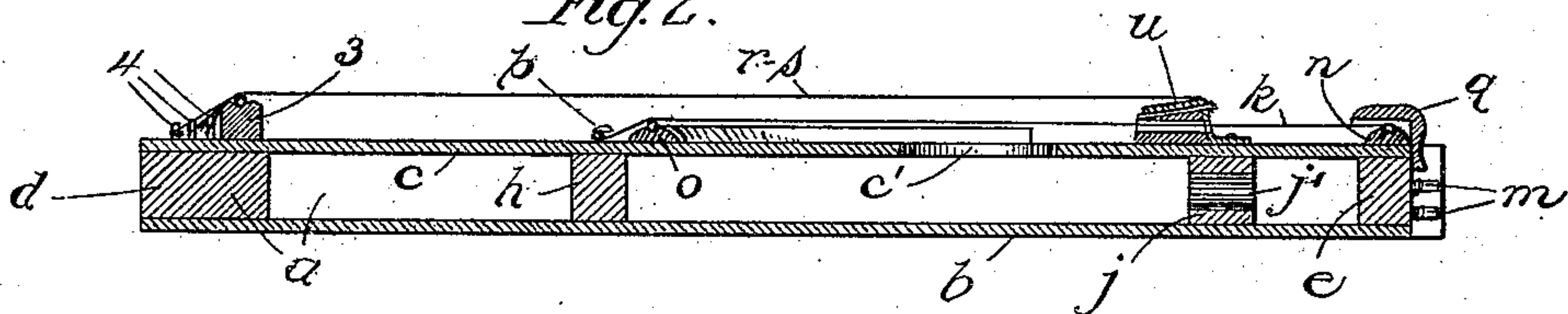


Fig. 3.

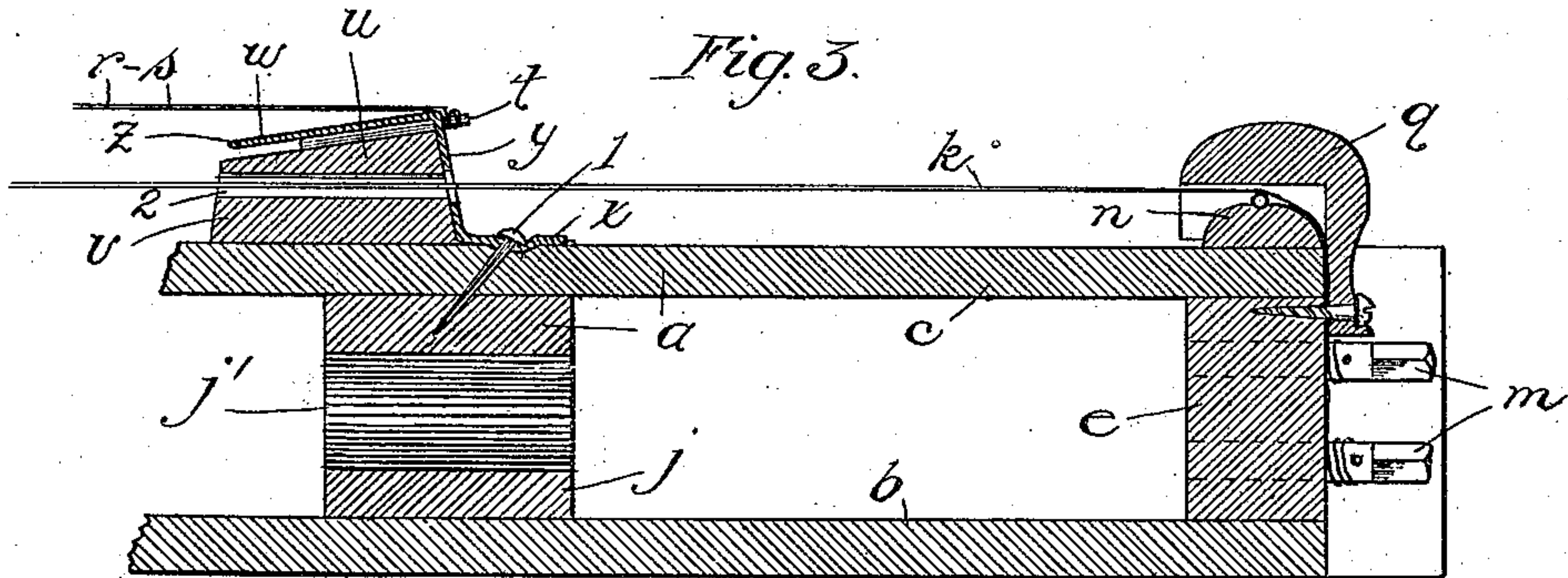
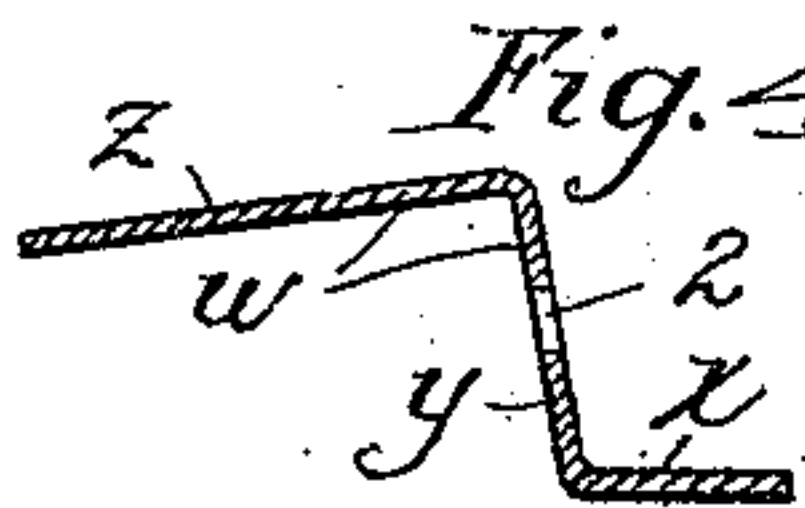


Fig. 4.



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UNITED STATES PATENT OFFICE.

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STRINGED MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 690,463, dated January 7, 1902.

Application filed July 21, 1900. Serial No. 24,360. (No model.)

To all whom it may concern:

Be it known that I, FOREST A. PORTER, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Stringed Musical Instruments, of which the following is a specification.

My invention relates to stringed musical instruments having two sets of strings designed to be picked or struck by the fingers or otherwise, my present instrument being known as a "lyre-harp."

The objects of my invention are, first, to provide an instrument wherein the strings are brought into a comparatively small area, thereby reducing the size of the instrument; second, to so place the strings that the hands of the performer may be placed advantageously upon the instrument; third, to so locate the string-supporting bridges as to prevent the warping or buckling of the sounding-board; fourth, to provide a bridge and bridge-plate of novel construction, and, fifth, to provide the other details hereinafter set forth. I accomplish these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the instrument. Fig. 2 is a vertical section of the instrument, taken on the line 2 2, Fig. 1. Fig. 3 is an enlarged vertical section of a portion of the instrument as in Fig. 2, showing the method of attaching the chord-strings to the lower bridge and also showing certain other details of construction. Fig. 4 is a detail view of the bridge-plate as shown in Fig. 3.

Similar characters refer to similar parts throughout the several views.

The body *a* of the instrument consists of the bottom board *b*, the sounding-board *c*, parallel to said bottom board at a suitable distance above the same, and the frame-pieces *d*, *e*, *f*, and *g*, said frame-pieces *d* and *e* being located at the upper and lower extremities of the instrument and forming the head and tail pieces, respectively. Said pieces *f* and *g* form the side frames of the instrument-body, the frame-piece *g* being preferably constructed to form a sweeping double curve, as shown. The sounding-board *c* is provided with a sound-hole *c'*, located in an approximately central position, and is reinforced by means of

the frame-pieces *h* and *j*, hereinafter referred to. The strings *k k* are tuned to the steps and half-steps or intervals requisite for producing a melody when properly played by the performer and run substantially lengthwise of the instrument. Said strings *k* lie in a plane which is preferably parallel to the sounding-board *c* and are attached to the wrest-pins *m m*, secured to the tailpiece *e*, which latter constitutes the lower wrest-plank of the instrument. From said tailpiece *e* the strings *k k* extend over the bridge *n*, located at or near the lower extremity of the instrument, and said strings extend thence over the bridge *o*, located intermediate of the extremities of the instrument. Said bridge *o* rests upon the sounding-board *c*, preferably in such a position as to extend for the most part obliquely with reference to the tailpiece *e*, and upon the side of the sound-hole *c'* opposite to said tailpiece. The upper extremities of the melody-strings *k k* are fastened beyond the bridge *o* by means of the pins *p p*, which pass into and through the sounding-board *c* and into the brace or frame piece *h*, above mentioned. Said frame-piece *h* is by preference similar in outline to the bridge *o* and is located a slight distance beyond said bridge in order to receive said pins *p p* and at the same time reinforce the sounding-board *c*. Extending across the lower extremity of the instrument is secured the hood-like piece *q*, which forms a guard for the bridge *n* and adjacent portions of the instrument and also forms a rest for the fingers and hand employed in sounding the melody-strings *k*. The chord-strings *r r s s* are tuned in groups, so as to form chords harmonizing with said open-scale strings or melody-strings *k*, and I prefer to place said strings in a plane parallel to the plane of the strings *k* and raised sufficiently above the latter to prevent interference during vibration. I prefer also that the melody-strings and the chord-strings extend in the same direction, both to improve the appearance of the instrument and to render the instrument more easily played upon by reason of the resulting symmetry. A suitable arrangement of the chord-strings is shown in the drawings, in which the heavier lines *r r* represent the fundamental or root tones of the chord, and the adjacent lighter lines *s s* rep-

resent the higher tones corresponding to the harmonics or overtones of the respective fundamentals.

The lower extremities of the chord-strings *r* and *s* are attached to the pins *tt* in the lower bridge *u*. Said bridge *u*, which is of special construction, as shown in detail in Figs. 3 and 4, is located upon the sounding-board *c* at a point between the tailpiece *e* and the bridge *o* at such a distance from the said tailpiece as to afford ample room for the performer to strike or otherwise sound the melody-strings *k* at a portion thereof between said bridge *u* and tailpiece *e*. By preference said bridge *u* extends in a direction parallel to the tailpiece *e* and hand-rest *q* and lies between said tailpiece and the sound-hole *c'*. The main body of the bridge *u* consists of the strip *v*, preferably of wood, secured in position upon the sounding-board *c*, and is preferably of a height somewhat greater than the distance of the melody-strings *k* above said sounding-board. The top surface of said strip is inclined relatively to the sounding-board, the rear edge of said strip toward the tailpiece being higher than the forward edge of said strip. The bridge-plate *w* (shown separately in Fig. 4) consists of a preferably single piece of metal, approximately Z-shaped in cross-section, thereby forming the portions *x*, *y*, and *z*. The portion *x* of the plate *w* extends along the surface of the sounding-board adjacent to the strip *v* and is securely fastened in position, preferably by means of the pins *l*, which extend through said portion *x* and also through the sounding-board *c* into the frame-piece *j*, previously mentioned. The portion *y* of said piece *w* covers the rear surface of the strip *v* and extends at approximately right angles to the sounding-board *c*. The upper portion *z* of said plate *w* extends from the upper edge of the said portion *y* in a direction toward the upper extremity of the instrument and more or less completely covers the top of the strip *v*. By preference said portion *z* is removed a slight distance from the upper surface of said strip *v*, and thereby affords space for receiving the pins *tt*, above mentioned, said pins lying for the most part between said portion *z* and strip *v* and being thus held in position. The portion *y* of said plate *w* is apertured at suitable intervals to afford a passage for said pins *l*, the projecting extremities of the latter affording means of attachment for said strings *r* and *s*. Said portion *z* preferably has a pitch conforming to the pitch of the upper surface of the strip *v*, thereby clearing the chord-strings, except where said strings rest upon the plate *w* at a point adjacent to the portion *y* thereof. Both the plate *w* and strip *v* are provided with a series of apertures 2, extending substantially horizontally in such a manner as to permit the passage of the melody-strings *k* through the bridge *u*.

The frame-piece *j*, above mentioned, is approximately coextensive with the strip *v*, being thereby in position to receive and hold the pins *l*, whereby the bridge-plate *w* is secured. Said frame-piece is provided with apertures *j'* for the purpose of lightening said piece and also for the purpose of improving the tone of the instrument. As the bridge-plate *w* is secured directly to the sounding-board at a point to the rear of the strip *v*, the tension of the chord-strings *r* and *s* tends to force the portions *y* and *z* of the plate *w* in a forward and downward direction upon the sounding-board *c*. This construction greatly lessens the danger of tearing the strip *v* from its location, which is of great advantage in the present instrument, where the bridge *u* preferably rises to a greater height above the sounding-board *c* than do the remaining bridges *n* and *o*.

The chord-strings *r* and *s* extend to and across the bridge 3, located preferably over the frame-piece *d* near the upper extremity of the instrument and parallel to the bridge *u*. Said chord-strings thence extend to the wrest-pins 44, located at a point beyond said bridge 3, nearer the upper extremity of the sounding-board.

I attach special importance to the location of the bridges *n*, *u*, *o*, and 3, which are placed in such a manner that the bridge *u* occupies a position between the extremities of the melody-strings *k*, and the bridge *o* occupies a position between the extremities of the chord-strings *r* *s*. By this means the strings may, if desired, all extend in the same direction and at the same time cover a comparatively small area notwithstanding the allowance of sufficient space between the bridges *n* and *u* for conveniently playing upon the melody-strings *k*. By raising the crown of the bridge *u* above the melody-strings in the manner shown the chord-strings *r* *s* may with equal facility be struck or played at any portion of their length. Although I do not confine myself to a construction in which the chord-strings are at all points above the melody-strings, I consider this present construction as most suitable.

For convenience of the performer a hand-rest 5 is provided at a point upon the sounding-board in juxtaposition to the chord-strings *r* *s*.

Although it is preferable that all the strings *k*, *r*, and *s* extend in the same direction, it is evident that a certain variation may be made in this respect without departing from my invention, it being essential, however, that the extremities of one or more of the strings in one set shall lie at a point within the area covered by two of the strings of the other set.

What I claim as new, and desire to secure by Letters Patent, is—

1. A musical instrument having two sets of strings extending in substantially the same direction, portions of said sets being coexten-

sive or covering a common area of the instrument, each set having one or more strings terminating at points within the area covered or laterally bounded by strings of the other set, and said sets lying in different planes, one set completely above the other.

2. In a musical instrument, two sets of strings extending in the same general direction, one set being elevated above the other of said sets throughout the entire extent of the upper of said sets, and the lower of said sets extending at at least one end beyond the said upper set.

3. In a musical instrument, the combination of a sounding-body, and sets of strings extending in the same general direction and lying in two substantially parallel planes, a portion of one set of strings being superimposed above a portion of the other set of said strings, thereby exposing the entire length of the upper set of strings for striking or sounding the same and at least one end of the lower set of strings extending beyond the ends of the upper set thereby exposing a portion of said lower set for striking or sounding the same.

4. In a musical instrument or lyre-harp, the combination of a set of melody-strings, bridges for supporting the same, one of said bridges being intermediate of the extremities of said instrument, a set of chord-strings extending in both directions over said intermediate bridge, and bridges for supporting said chord-strings, one of said last-mentioned bridges lying between the bridges whereby the melody-strings are supported, said chord-strings extending their entire length above said melody-strings, thereby removing the same from the melody-strings, and permitting a plurality of

said chord-strings to be sounded simultaneously with a sweeping stroke or touch.

5. In a stringed musical instrument a bridge comprising a strip of wood or other suitable material mounted upon the body of the instrument and a metallic bridge-plate secured to the body of said instrument and having portions extending over portions of said strip for relieving the same from strain.

6. In a stringed musical instrument, the combination of a sounding-board, a bridge-strip mounted upon the same, a metallic bridge-plate secured to said sounding-board and extending over said strip, and pins where-to the strings may be attached, said pins being held in position by means of said strip and bridge-plate.

7. In a stringed musical instrument the combination of a sounding-board, a bridge-strip mounted thereon, a bridge-plate secured to said sounding-board and covering part at least of said strip, pins projecting through said plate and also having a portion lying between said plate and said strip, and strings attached to the projecting portions of said pins.

8. A concert zither, provided with an open scale of leading strings and a number of groups of accompanying strings arranged intermediately with the rear strings of the leading strings, the inner ends of the accompanying strings being raised above the level of the leading strings and the outer ends of the leading strings extending beyond the inner ends of the accompanying strings.

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