

No. 666,016.

Patented Jan. 15, 1901.

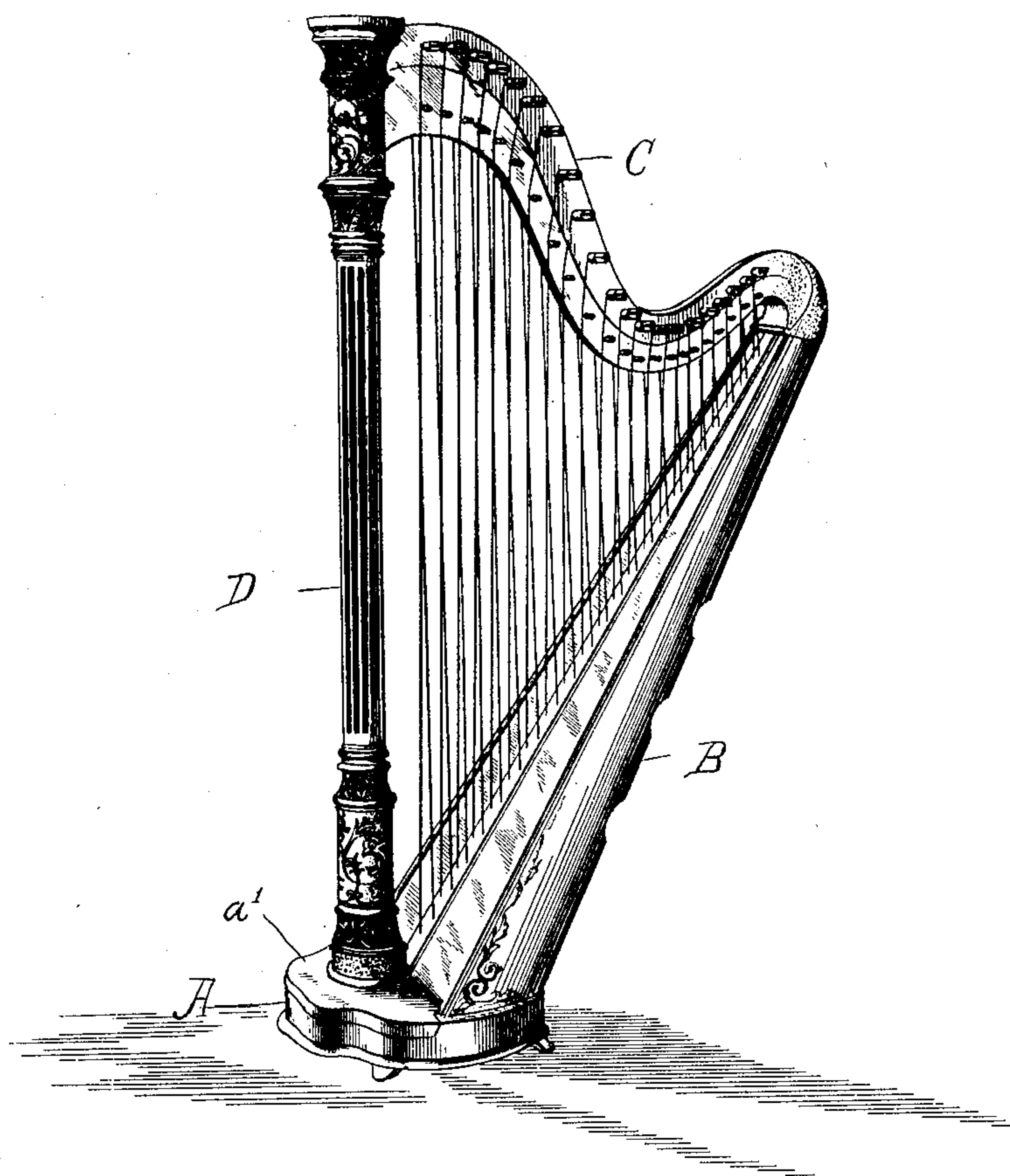
L. LEHMAN.
HARP.

(Application filed Feb. 1, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig-1-



Witnesses
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by Parkinson, Foster & Graves,
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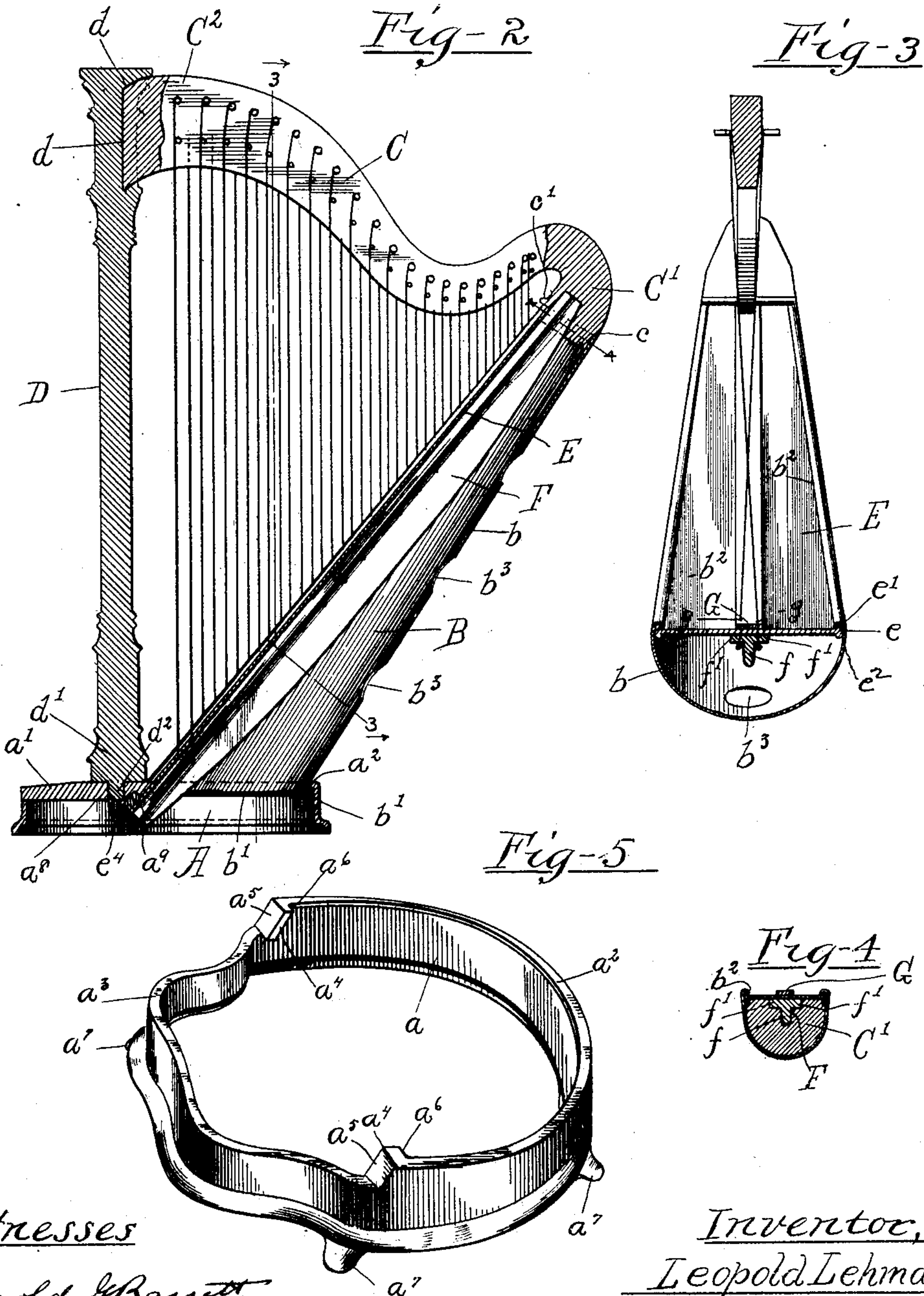
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UNITED STATES PATENT OFFICE.

LEOPOLD LEHMAN, OF CHICAGO, ILLINOIS.

HARP.

SPECIFICATION forming part of Letters Patent No. 666,016, dated January 15, 1901.

Application filed February 1, 1897. Serial No. 621,416. (No model.)

To all whom it may concern:

Be it known that I, LEOPOLD LEHMAN, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Harps, of which the following is a specification.

This invention relates to improvements in harps; and its object is to provide improvements in the details of construction of instruments of the character referred to.

As heretofore commonly constructed harps have been necessarily relatively high-priced instruments, owing, among other things, to the large amount of highly-skilled labor and complicated parts involved in their construction. Another item of cost which has tended to maintain the high prices for these instruments is the excessive cost of transporting the same, due both to their bulky form and to the fact that being classed as "stringed instruments" they are charged for by the transportation companies at "double first-class rates." Among other things, the present invention therefore has in view the simplification of the manufacture of the several parts which go to make up the instrument in such manner that less skilled or ordinary labor may be employed in their production with satisfactory results, to so construct the harp that the several members thereof may be taken apart and reassembled by any person of usual intelligence, thereby enabling the instrument to be shipped or stored in knock-down form, and at the same time to produce an instrument which is not only perfect as to its musical qualities, but is also less liable to become impaired and its parts distorted under the great and continued strain to which they are subjected when the instrument is strung up or in its normal condition.

The invention consists in the matters hereinafter described and more particularly pointed out in the appended claims, and the same will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a harp embodying my invention. Fig. 2 is a view, principally in longitudinal central section and partly in side elevation, showing the internal construction of the harp. Fig. 3 is a transverse sectional view taken on line 3 3 of Fig.

2. Fig. 4 is a similar view taken on line 4 4 of Fig. 2. Fig. 5 is a perspective view of the metal casting forming the base.

Referring to said drawings, A designates as a whole the base, B the body, C the neck or console, and D the post or pillar, of the harp.

The base A in the improved construction herein shown consists of but two pieces—a metal casting a and a foot or base board a' , arranged to fit and rest horizontally upon the base-casting, so as to cover over the front portion thereof. The metal base consists, as shown, of a ring-shaped casting of somewhat irregular outline, that portion thereof which underlies and forms the support for the lower end of the body being approximately of semicircular outline and provided at its upper margin with an inturned overhanging flange a^2 , while the front portion of the casting is of reduced height and provided with a smooth upper edge a^3 , adapted to receive and support the footboard a' . At the points of juncture of the rear portion with the portion of reduced height of said base-casting inwardly-projecting parts a^4 are formed having oblique faces a^5 , against which the rear beveled edge of the footboard rests, while the inturned flange a^2 is continued inwardly along the upper margins of said inturned parts a^4 , as indicated at a^6 . Preferably the lower edge of the casting will be provided with a plurality of integral feet a^7 in order that the harp may rest more firmly upon irregular surfaces when the instrument is being played, this being of some importance as effecting the sound of the instrument.

Preferably and as shown herein the back wall or shell b of the body is made of sheet metal. Said shell is of approximately semicircular form in cross-section and is made tapering uniformly from the base to top thereof, as is usual, the lower end being of such diameter as to fit snugly within the ring-shaped base and being provided at its lower end margin with an outturned flange b' , which engages and interlocks with the overhanging flange of the base. The side margins of the shell are provided with semicircular inturned rolls b^2 , (see Figs. 3 and 4,) adapted to receive and hold the edges e of the sounding-board E, as hereinafter more fully described.

The console or neck is of the usual shape in

its general contour and is suitably reduced and conformed at its rear end C' to telescope a short distance within the upper end of the shell of the body, the extent being determined by a circumferential shoulder c , which engages the end margin of said shell, the outer surfaces of said parts being thus brought exteriorly flush with each other. At its forward end C^2 the neck is curved downwardly more than usual to give it a somewhat hooked form, and the extreme end of this portion is arranged to fit within a correspondingly-shaped mortise d , formed in the head of the post D . It will be apparent that the construction of these parts is such that when the harp is assembled and the strings thereof drawn taut the strain of the strings tends to draw the parts more firmly together. The post D is in other respects of the usual construction and may of course be made of any preferred ornamental design. The lower end d' thereof is suitably seated upon the base or foot board a' , preferably and as shown herein, by means of a tenon or stud d^2 , formed upon or inserted in the lower end of the post and arranged to engage a suitable aperture or recess a^8 , formed in said footboard.

The sounding-board E is made relatively thin of any suitable wood and also tapered from the bottom to top to correspond with and fit within the shell b . Along each side margin of the sounding-board, and at the upper or outer surface thereof, is secured or formed a rib or bead e' , which beads fit within and engage the inturned semicircular rolls of the shell, thereby locking said parts together firmly throughout the length of the body. Preferably, also, a similar bead or rib e^2 is secured along each side margin of the sounding-board upon the under side thereof; but this is not strictly essential, inasmuch as its only function is to make the margins of the board more rigid. At its lower end the sounding-board extends downwardly some distance within the metal base and below the lower surface of the footboard. The rear margin of the latter is suitably beveled and arranged to fit firmly against the face of the sounding-board, as indicated clearly in Fig. 2.

The strain of the strings of the instrument upon the sounding-board obviously tends to draw the same upwardly relatively to the footboard, which latter is held down by the post, and in order to hold said sounding-board positively from movement relatively to the base a rectangular block e^4 is secured rigidly upon the outer or upper surface of the lower end of said sounding-board in such position as to fit within and engage a correspondingly-shaped recess a^9 , formed centrally in the under surface of the footboard adjacent to its rear margin, also as shown in Fig. 2. Inasmuch as the foot of the post extends over or overlies this part of the footboard, there is no possibility of springing or yielding of the footboard, and the sounding-board is therefore held immovable.

The upper end of the sounding-board rests upon the flat face of that part of the neck which projects within the body, (see Fig. 4,) while its extreme end margin abuts against the shoulder c , hereinbefore referred to. For appearance sake a bead c' is formed to extend across the neck adjacent to the end of the sounding-board, thus rendering its appearance uniform with the finish of the side margins of said board.

As a further important feature of the present invention and one which conduces greatly to the musical qualities of the instrument and to the facility with which its several parts may be separated and reassembled, I provide a bridge or backbone piece F , which extends from the rear end of the neck downwardly within the body to the base and is in itself of sufficient rigidity to sustain the entire strain of the strings without material distortion, thereby practically relieving the sounding-board of this strain and enabling the latter to be made lighter and therefore more resonant. Said bridge in its preferred form is made approximately T-shaped in cross-section, consisting of a relatively deep vertical web f , widest at the central portion of the bridge and tapering toward each end thereof, and lateral flanges or extensions $f' f'$, formed integrally with the web f . The upper surface of the bridge rests against and is secured to the under or inner surface of the sounding-board throughout the entire length of the latter, and inasmuch as said bridge extends at its lower end the full length of the sounding-board and beneath the retaining-block a^9 it will be obvious that it is positively supported at this end against the uplifting strain of the strings. At its upper end the bridge is prolonged beyond the end of the sounding-board and is arranged to fit within a correspondingly T-shaped mortise formed in the end of the neck, thus forming a rigid connection with the latter.

The harp herein shown, constituting the preferred embodiment of my invention, is strung chromatically with the strings corresponding to the diatonic or natural scale strung from a set of keys arranged all on one side of the neck and extending thence downwardly to points on the sounding-board a short distance to one side of the median line of the latter and at the side opposite the one upon which the upper ends of the strings are attached, while the remaining or intermediate half-tone strings are strung from a set of keys arranged upon the side of the neck opposite the first set and extend thence downward to points upon the sounding-board removed from the median line of the latter an equal distance with those of the other set, but upon the opposite side therefrom. The strings of one set are thus arranged to cross those of the other about midway of their length, so that both sets are accessible to either hand of the player by simply moving the position of the hand up or down.

Preferably an external bridge-strip or reinforcement G is secured along the median line of the sounding-board upon the upper surface thereof, said strip being of sufficient width to receive the two rows or series of string-apertures *g*, which latter are extended through the sounding-board proper and through the underlying lateral flanges *f'* of the bridge.

In stringing the instrument the strings are placed through the apertures *g* and the ends knotted within the body, so that the bridge proper takes practically the entire strain of the strings. In order to provide access of the hand for thus knotting the strings, the shell is provided with a plurality of hand-holes *b*³.

The operation of assembling the harp may be briefly described as follows: The sounding-board and bridge secured thereto are first placed within the shell B and the marginal ribs of the board interlocked with the inturned edges of the shell. The smaller end of the body is next passed upwardly through the base-casting until the outturned lower end flange thereof engages with the overhanging flange of said casting and limits its further movement. The footboard is next placed in position upon the base, the post seated upon the footboard, and lastly the neck is inserted at its front end within the mortise of the post and its rear end telescoped within the upper end of the body and over the projecting end of the bridge. This completes the assembly of the harp and places it in readiness to receive the strings. The stringing of the harp has been heretofore fully described and need not therefore be repeated. The taking apart of the harp is of course the exact reverse of the process of assembling it.

The construction of the bridge F in the manner described—that is to say, in the form of a relatively deep or web-shaped support and of increasing vertical depth or width from each end toward the central portion thereof—is a feature of great importance, inasmuch as this construction not only affords the necessary rigidity or stiffness to withstand practically the entire strain of the strings, and thus prevent distortion of the sounding-board, but at the same time serves to equalize the volume or tone of the instrument throughout its entire register—i. e., throughout the length of the sounding-board—since the end portions of the bridge, which have rigid connection with the foot-plate and neck, respectively, and are consequently more rigid than the central portion, are thus rendered lighter, and consequently more easily thrown into vibration by the strings than would be the case were the bridge of uniform weight and strength throughout its length, while, on the other hand, the central portion, which would otherwise be more easily thrown into vibration, is rendered more rigid by the increased weight and strength of this portion of the bridge and its vibratory quality thus made approximately uniform with that of

the end portions. Theoretically the point of greatest thickness and rigidity should be below the center of the bridge, because the longer strings of the harp are heavier, and consequently tend to impart greater vibration to the sounding-board; but in practice the form illustrated herein has proved exceedingly effective.

While I have herein shown and described the harp as strung chromatically, yet it will be obvious that the more usual method, such as is commonly employed in stringing pedal harps, may be employed without substantially changing the salient features of my invention, or, in other words, these features are applicable to pedal-harps.

I claim as my invention—

1. A harp comprising as its principal members a base, a body provided with interlocking means which engage the base detachably and whereby the body is held against separation from the base by the lifting strain of the harp-strings, a post seated upon said base, and a neck entered at its respective ends within the post and upper end of the body, so as to be held detachably interlocked therewith by the downward strain of the strings.

2. In a harp, the combination with the base, the post seated thereon, a body provided with interlocking means which engage the base detachably and whereby it is held against separation by the lifting strain of the harp-strings, a neck detachably connecting the upper part of the post with the upper end of the harp-body and a bridge interlocked at its lower end with the base and extending thence upwardly through the body and engaged with the rear end of the neck.

3. In a harp, the combination with a metal base, provided around its upper margin with an inturned flange, of a sheet-metal body-shell, provided at its lower end with an outturned flange adapted to interlock with the overhanging flange of the base.

4. In a harp, the combination with a metal base, provided around its upper margin with an inturned flange, of a sheet-metal body-shell, provided at its lower end with an outturned flange adapted to interlock with the overhanging flange of the base, and having its side margins turned inwardly to interlock with the margins of the sounding-board.

5. In a harp, the combination of the base, the body, the lower end of which partly occupies said base, the footboard covering the remainder of the base, the post seated upon the footboard, the neck connecting the upper end of the post with the upper end of the body and the bridge extending from the rear end of the neck longitudinally through the body into the base and provided with positive interlocking means connecting it with the footboard beneath the post.

6. In a harp, of the character described, the combination with the sounding-board provided at its side margins with longitudinally-extending ribs, of the metal body-shell pro-

vided at its side margins with the inturned portions forming grooves adapted to receive the ribs of the sounding-board.

7. In a harp, the combination with a body
5 composed in part of a thin resonant sounding-board, of a bridge secured to the inner side of said sounding-board and extending from neck to base of the harp, said bridge being made of increasing vertical depth from each
10 end toward the central portion thereof, whereby both the resonance and rigidity of the sounding-board are rendered more uniform throughout the length of the sounding-board, substantially as described.

15 8. In a harp having a body devoid of transverse strengthening-ribs, the combination

with a thin resonant sounding-board, of a bridge secured to the inner side thereof and extending from neck to base of the harp, said bridge being of T shape in cross-section and
20 provided with a set of string-apertures in each of its lateral extensions, laterally outside of the central web thereof and said central web being of increasing vertical depth from each end toward the central portion thereof. 25

In witness that I claim the foregoing as my invention I affix my hand in the presence of two witnesses.

LEOPOLD LEHMAN.

Witnesses:

ALBERT H. GRAVES,
HENRY W. CARTER.