

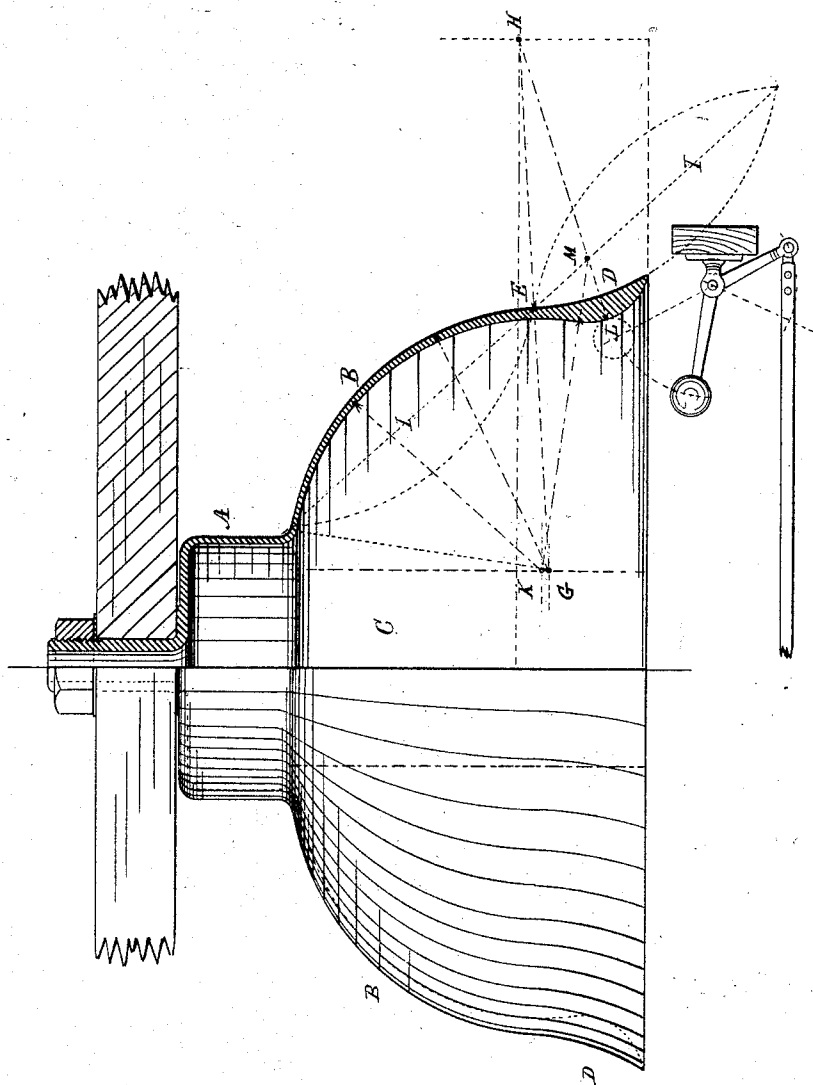
(No Model.)

F. WIDDOWS.

MUSICAL BELL FOR CHURCH AND OTHER CHIMES.

No. 352,794.

Patented Nov. 16. 1886.



WITNESSES.

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UNITED STATES PATENT OFFICE.

FREDERICK WIDDOWS, OF WASHINGTON, DISTRICT OF COLUMBIA.

MUSICAL BELL FOR CHURCH AND OTHER CHIMES.

SPECIFICATION forming part of Letters Patent No. 352,794, dated November 16, 1886.

Application filed March 6, 1886. Serial No. 194,232. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WIDDOWS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Musical Bells for Church and other Chimes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in the construction of bells used either singly or arranged in chimes.

The objects of my invention are, first, the production of bells of a superior musical tone to those now in general use; second, to produce bells of a given note or pitch with less than half of the customary amount of metal employed, thereby reducing the first cost to such an extent as to bring the price of a complete chime of bells within the reach of a large number of people from whom they hitherto have been debarred on account of the great expense.

Having been for several years impressed that an improvement in bells was possible when arranged in chimes for playing pieces of music either in simple melody or harmony, and believing that if they could be made to conform in shape to the sound wave or vibration of a musical note it would improve their tone quality, and thereby render it more musical than that produced by bells in common use, and which are intended for ringing peals or changes by oscillating or swinging of the bells, I have therefore invented and constructed a bell the external lines of which are in accordance with this theory, or as near to the form of a sound-wave as possible, and which in my judgment meets all of the requirements.

I do not claim that these bells shall supersede the present form when used singly as church-bells, and when it is necessary that the sound should reach to a great distance; but I do claim that when arranged in a stationary frame and played so as to be heard within a reasonable distance the tones produced shall bear a better harmonic relation to each other and more in accordance with the laws of musical sounds.

Referring to the drawing, the figure represents in elevation, partly in section, a bell made

in accordance with my invention, together with a striking apparatus which I prefer to use.

The letters refer to the parts in detail.

A is a chamber on the crown of the bell, which I term a "resonating-chamber," and is for the purpose of giving the bell a more resonant and musical tone.

B B represent the waist or body of the bell, which, by preference, gradually increases in thickness from the top to the bottom.

C represents a space in the form of a parallelogram, separating the waist portion B B and giving to the bell its oblate form, as more particularly hereinafter described.

D D represent the lip or sound-bow, the outer curve of which is in reverse of that of the waist, and of similar radius, as shown at E.

L represents the enlargement of metal in rear of the curved contour of the lip D D, and forming the sound-bow or striking-point of the bell.

The remaining letters, having reference to points for obtaining the curves above named, are more specially hereinafter referred to.

The height of the bell, including the resonating-chamber, from the inside should be about seven-twelfths of the diameter. The form of the bell in vertical section at the upper portion is that of two sectors of circles, B B, separated

by a parallelogram, C, and the lower portion is formed by reverse curves D D, intersecting the circles describing the sectors B B at the points E E. The radius-point G, from which is described the sector B B, commencing at the base of the resonating-chamber A, is placed

equidistant from the base and central perpendicular lines and at a distance of one-eighth of the diameter of the bell. The reverse D is described with the same length of radius as that

of the sector B, and from a point, H, one-sixth of the diameter of the bell above the base-line forming the lip of the bell, thus conforming in exactitude with the sound-wave indicated by

the dotted lines I I. The inside circle of the upper portion of the bell is described from a radius-point, K, placed perpendicularly above the point G at a distance therefrom equal to the thickness of the bell at the base of the resonating-chamber A, forming a regularly-in-

creasing thickness, and the reverse curve L, which forms the thickness of the sounding-bow, is described from the radius-point M, the location of which is dependent upon the thickness

of the sounding-bow, which should be in the proportion of from one thirty-second to one twenty-fourth of the diameter of the bell, and which is varied to give the pitch of tone required.

I am aware that a bell having the swell or sounding-bow projecting entirely inward from the general outline of the body is not new, and such I do not claim, broadly; but,

10 Having thus fully described my invention, what I claim as new, and what I wish to secure by Letters Patent, is—

1. A bell provided with the resonating-chamber A, located on the apex and constituting the crown of the bell, substantially as and for the purpose set forth.

2. In combination with the body or waist B of a bell, the lip or sounding-bow D, projecting entirely inward, and the external outline of which forms a reverse curve to that of the waist, the two curves being of equal radii, substantially as described and shown.

3. In a bell having the body or waist B of an oblate hemispheroidal form, the lip D, the external outline of which forms a reverse curve to that of the body or waist B, the said curves being of equal radii, substantially as and for the purposes set forth.

4. In a bell, the resonating-chamber A, in combination with the body or waist B, having an oblate hemispheroidal form, and the lip D, the external outline of which forms a reverse curve to that of the body or waist B, the said curves being of equal radii, substantially as described and shown, and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK WIDDOWS.

Witnesses:

FENNER B. TAYLOR,
HARRISON DINGMAN.