

APPLICATION FILED DEC. 17, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

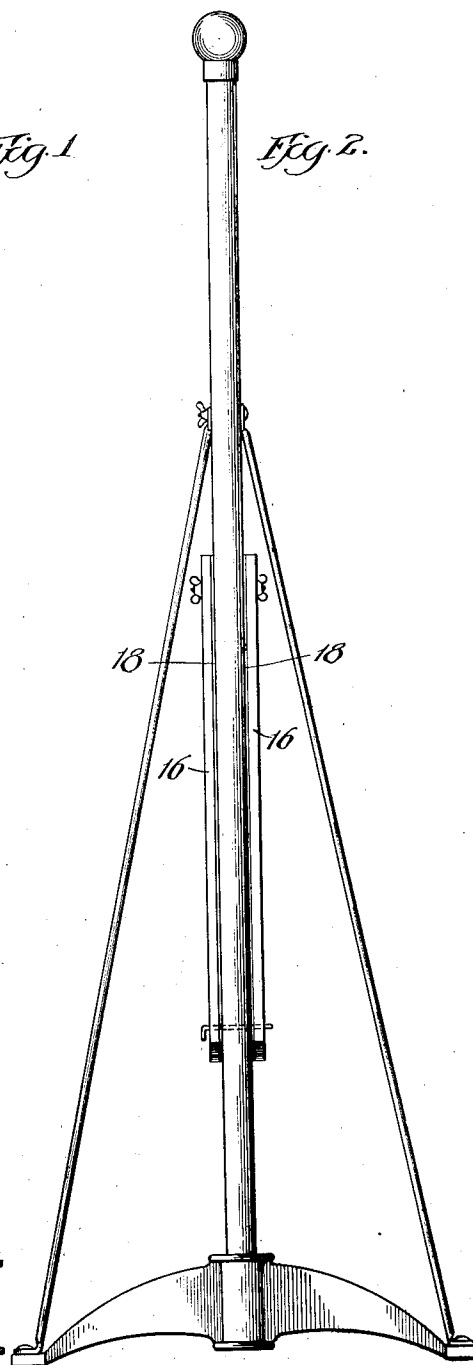


Fig. 2.

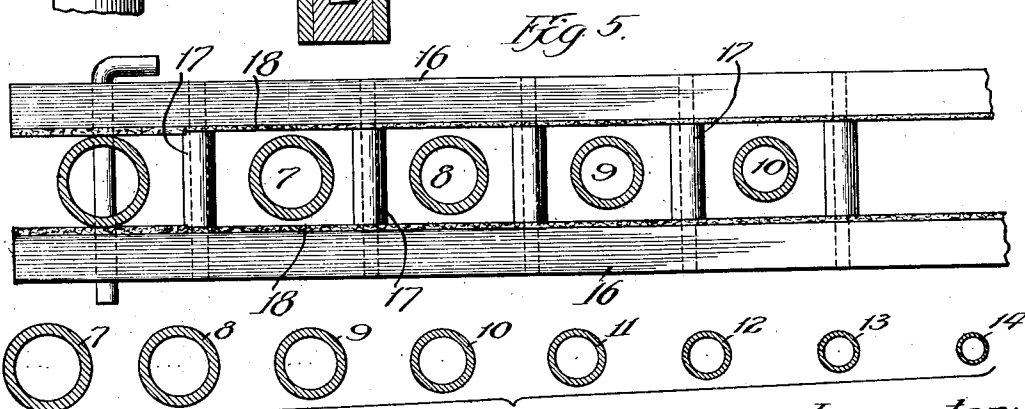
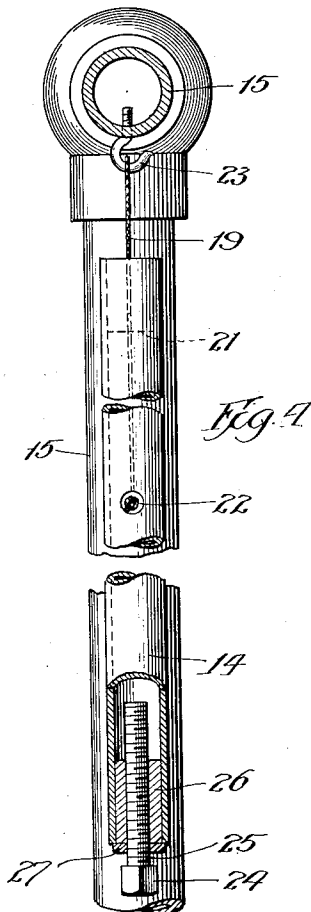
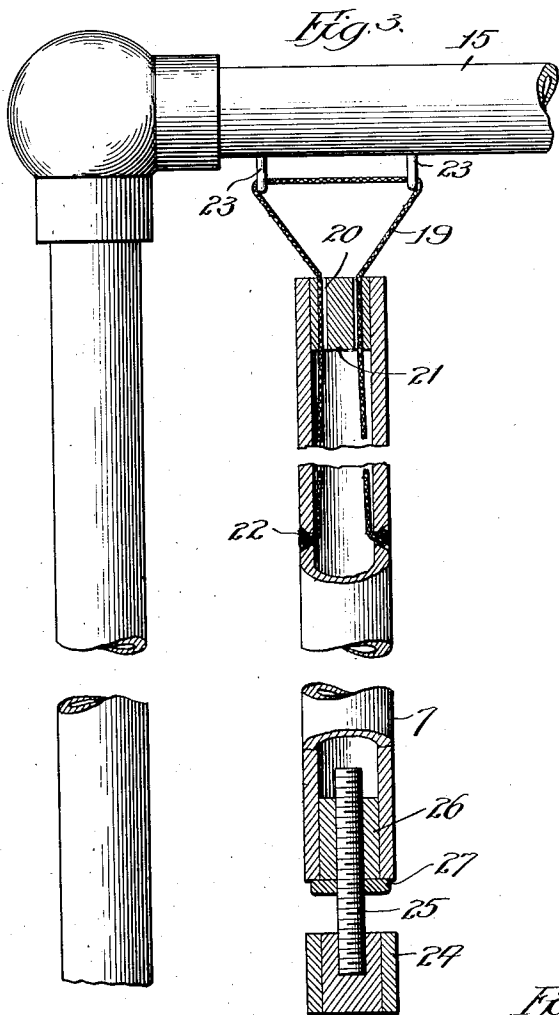
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1,100,671.

Patented June 16, 1914.

2 SHEETS—SHEET 2.



Witnesses:

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Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN CALHOUN DEAGAN, OF CHICAGO, ILLINOIS.

MUSICAL CHIMES.

1,100,671.

Specification of Letters Patent.

Patented June 16, 1914.

Application filed December 17, 1910. Serial No. 597,780.

To all whom it may concern:

Be it known that I, JOHN C. DEAGAN, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Musical Chimes, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to musical chimes and has a number of objects and advantages which will fully appear by a description of the preferred embodiment of the invention shown in the accompanying drawings but to which specific embodiment, however, I do not wish to be limited as further embodiments of my invention may be made without departing from the spirit thereof.

In the drawings Figure 1 is a view in elevation of a musical instrument constructed in accordance with the invention; Fig. 2 is a side view of the structure; Fig. 3 is a detail view looking from the front of the instrument, portions being broken away owing to lack of space available for illustration; Fig. 4 is a view in cross section showing another detail, parts again being broken away; Fig. 5 is a sectional view on line 5-5 of Fig. 1, and Fig. 6 is a diagrammatic view illustrating the graduated thickness of the walls of the tubular chimes that enter into the construction of the instrument and the graduated areas of the bores of such chimes taken in cross section.

Like parts are indicated by similar characters of reference throughout the different figures.

The tubular chimes 7, 8, 9, 10, 11, 12, 13 and 14 are suspended from the top rail 15 of a supporting framework in a manner which will hereinafter be set forth, the suspending means permitting the tubes to hang free so that they may vibrate when struck or are otherwise operated upon for the purpose of setting up vibration. The tubes are graded in length so as to produce tones of a musical scale, the instrument illustrated being capable of producing those tones that are described in musical notation as *c, d, e, f, g, a, b, c*, the tube 7 producing the lower *c*, the tube 14 the upper *c*, and the tubes between 7 and 14 producing the intervening tones in required order, though I do not

limit myself to a scale of this precise character.

It has hitherto been the practice to make tubes of uniform diameters both internally and externally with the walls of the tubes of different diameters having thicknesses out of proportion to their lengths when varied in the formation of musical instruments, it also being true that tubes of differing diameters had their thicknesses out of proportion relatively to each other in a given musical instrument. It has been found that instruments constructed in the old way would produce disagreeable over or partial tones, the over or partial tones often-times preponderating over the fundamental tones, particularly at the upper ends of the scale. I avoid the objectionable preponderating effect of the over or partial tones by having the thicknesses of the walls of the tubes decreasing from the lowest tone producing tube to the highest tone producing tube. Such an arrangement is diagrammatically illustrated in Fig. 6 which is intended to illustrate the relative dimensions of the outside diameters, inside diameters and the thicknesses of the tubes shown in Fig. 1. I thus have produced a musical instrument including a plurality of tubes of differing lengths for producing the tones of a musical scale, the thickness of the walls of each tube being greater than the thickness of each shorter tube, the external diameter of each tube being greater than the external diameter of each shorter tube and the internal diameter of each tube being greater than the internal diameter of each shorter tube. Satisfactory dimensions of the tubes of a musical instrument embracing the invention are as follows, the capital letters indicating the notes:

Note.	Lengths.	External diameter.	Thickness of wall.
C.....	48	1.600	.1983
C#.....	46½	1.588	.1277
D.....	45½	1.518	.1265
D#.....	44½	1.481	.1264
E.....	43½	1.445	.1175
F.....	42½	1.410	.1147
F#.....	41½	1.377	.1120
G.....	40½	1.345	.1096
G#.....	39½	1.316	.1070
A.....	38½	1.289	.1050
A#.....	37½	1.264	.1034
B.....	37½	1.241	.1034

A separator 16 is employed for keeping

the chimes apart at their lower ends, this separator having portions 17 passing into the spaces between adjacent chimes and in proximity to nodal points of such chimes where-
 5 by the vibration of the tubes is not materially interfered with if they should swing into contact with the portions 17. The portions 17 are desirably in the form of metal pins faced with rubber. The separator is
 10 also desirably provided with facings 18 of felt so that each tube is surrounded by non-sound conducting material.

Each tube is supported by a suspender which is preferably, though not necessarily,
 15 in the form of a loop 19 whose sides pass very freely through holes 20 provided in a plug 21 sweated in to the upper end of each tube when the tube is made of bell metal, which is the preferred material though I
 20 do not wish to be limited to any particular metal. Holes 22 are drilled into opposite side portions of each tube that communicate with the holes 20. The loops 19, which may if desired be made of cat gut, have
 25 their ends pass through the openings 20 and 22, the free ends of the loops thereafter being knotted or otherwise provided with enlargements to prevent the withdrawal there-
 30 of from engagement with the metal about the holes 22. The holes 22 in each tube are desirably located in close proximity to the nodal point near the top of the tube where-
 35 by to reduce or avoid any interfering influence which the suspender might have upon the vibration of the tube. The top rail 15 of the supporting frame is provided with a series of hooks 23 that engage the loops as illustrated most clearly in Fig. 3, whereby the tubes are suspended.

40 I preferably provide each of the tubes with a pitch adjuster made in accordance with another feature of my invention. This pitch adjuster, in the embodiment of the invention illustrated, includes a weight 24 that

desirably includes in its formation a thread- 45
 ed shank 25 in engagement with the threaded bore of a plug 26 in the lower end of the tube. The weights 24 are desirably smaller when applied to the shorter tubes, though in
 50 each instance the threaded shank forms a material part of the adjusting weight. By turning the weight it may be adjusted longitudinally of the tube until the desired
 55 pitch adjustment is secured, the adjustment after having been secured being maintained by a lock nut 27. I do not wish to be limited to the form of adjustable weight shown as I claim very broadly the use of a weight ad-
 60 justable longitudinally of the tube for tuning purposes.

I have filed a division of this application on Oct. 2, 1911, which bears Serial No. 652,410, this divisional application contain-
 65 ing claims that are directed to the construction and arrangement of a single musical sounding element, the claim in the present application being directed to the novel group of bells herein set forth.

Having thus particularly described one embodiment of my invention, to which, 70
 however, I do not wish to be limited, I claim as new and desire to secure by Letters Patent the following:

A musical instrument including a plurality of tubes of differing lengths for 75
 producing tones of a musical scale, the thickness of the walls of each tube being greater than the thickness of each shorter tube, the exterior diameter of each tube being greater than the external diameter of 80
 each shorter tube, and the internal diameter of each tube being greater than the internal diameter of each shorter tube.

JOHN CALHOUN DEAGAN.

Witnesses:

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