

No. 731,551.

PATENTED JUNE 23, 1903.

J. T. DUFF.
BELL.

APPLICATION FILED OCT. 25, 1901.

NO MODEL.

Fig. 1.

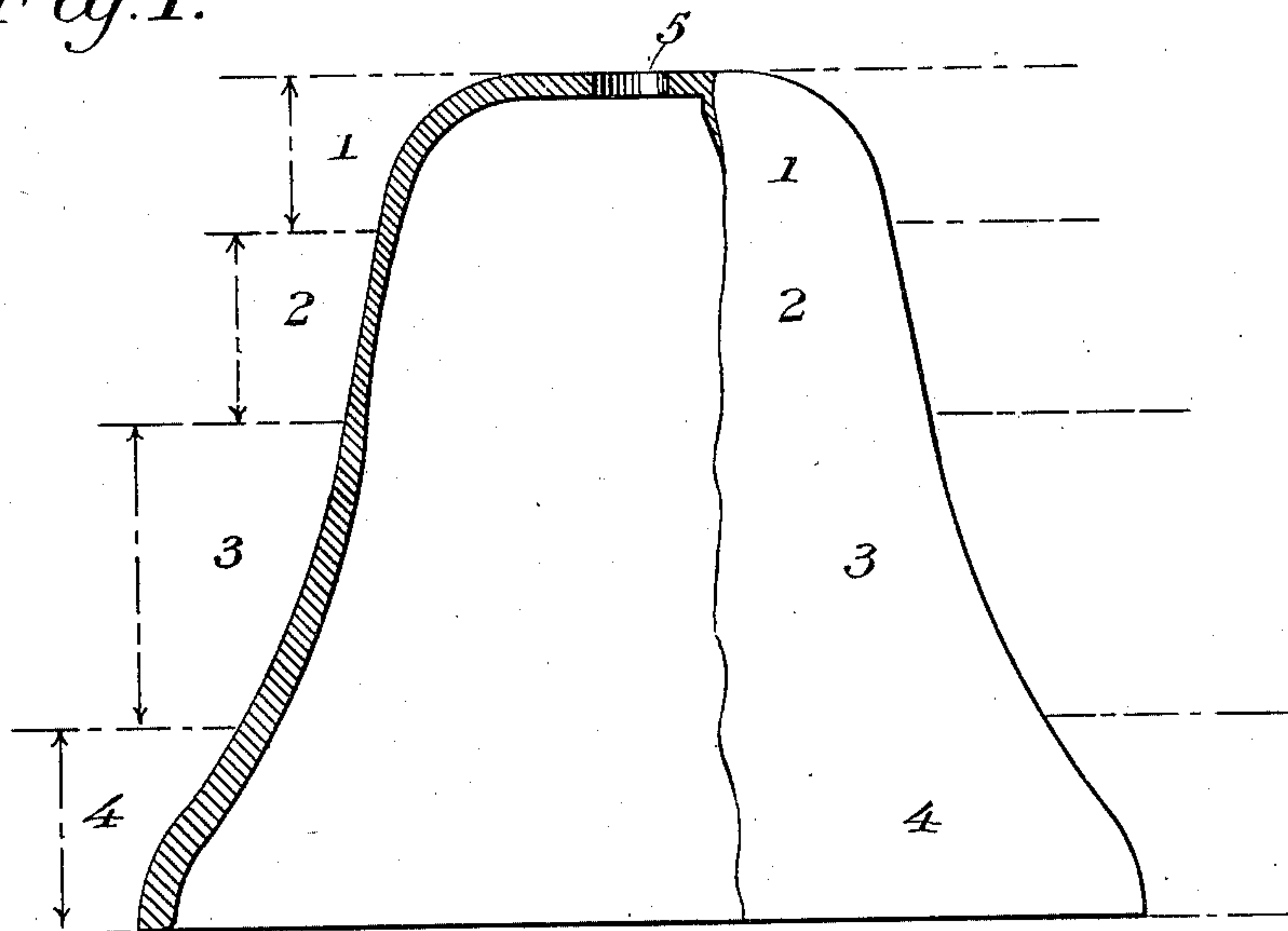
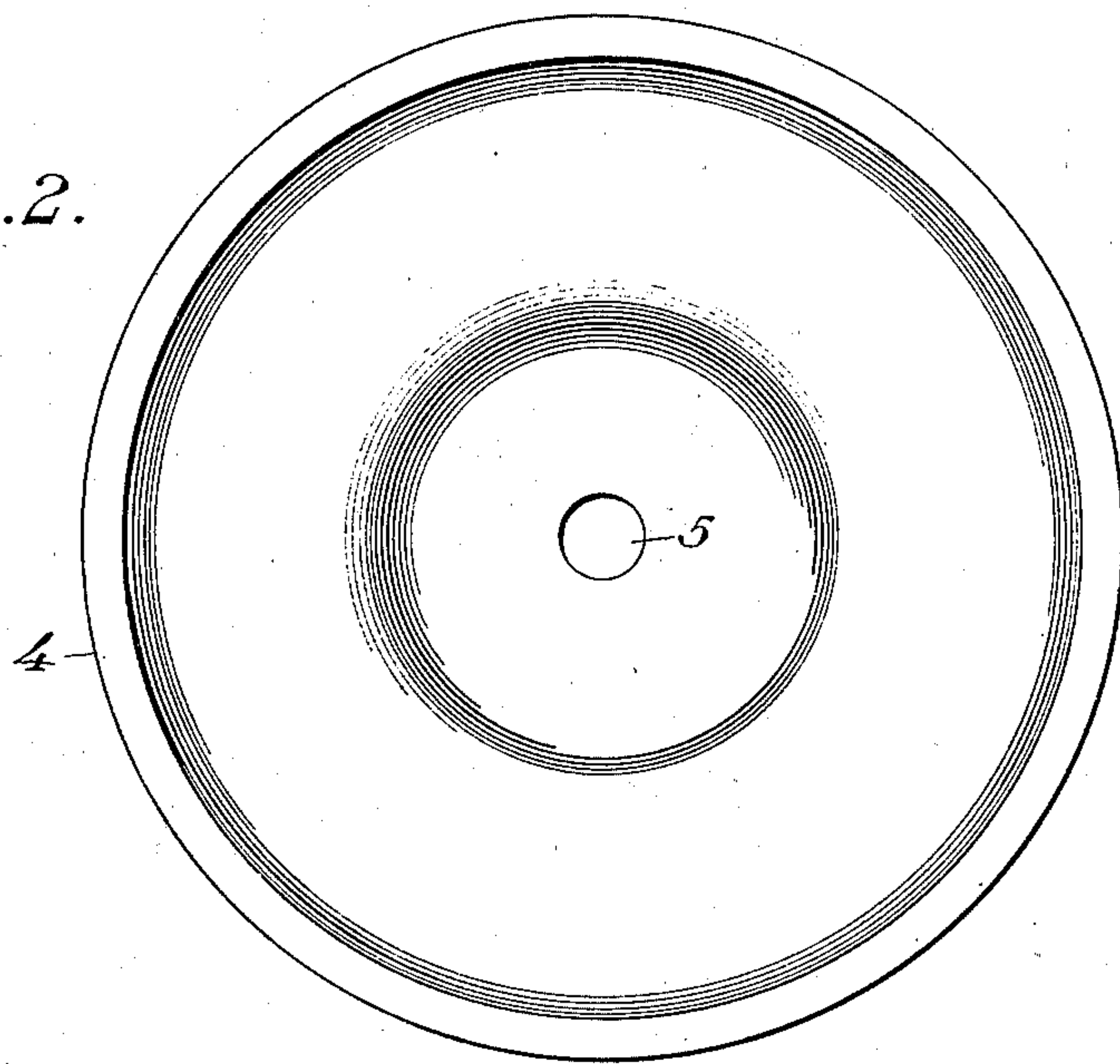


Fig. 2.



WITNESSES

J. J. Elmore
E. B. Henderson

INVENTOR

John T. Duff
by *W. B. Corwin*
Associate Attorney

UNITED STATES PATENT OFFICE.

JOHN T. DUFF, OF ALLEGHENY, PENNSYLVANIA.

BELL.

SPECIFICATION forming part of Letters Patent No. 731,551, dated June 23, 1903.

Application filed October 25, 1901. Serial No. 80,012. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. DUFF, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Bells; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in bells; and it consists in a bell made from a single disk of steel with walls of varying thickness.

The requisites of a good bell are that it shall be so formed as to give out a sonorous and musical sound, the former relating to the volume and character and the latter to the purity of the sound.

My invention is designed more particularly to secure purity in the sound by making bells uniform in density and thickness in corresponding portions of metal of uniform hardness and elasticity. To obtain these results by the usual process of casting has been found difficult, and even in the hands of the most skilled workmen the casting of a bell is subject to so many contingencies that the purity of the tone of the bell, as well as its character and volume, is ordinarily a matter of chance, and consequently the production of a set of chime-bells becomes by such ordinary casting process a matter of no little trouble and expense. To obviate these difficulties and to bring the conditions on which the tone of a bell depends within the intelligent control of the workman and to reduce the cost thereof, I have invented a seamless bell formed from a single sheet of steel with walls of varying thickness.

I shall now describe my invention by reference to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partially in section, of a bell constructed in accordance with my invention. Fig. 2 is a top plan view of the same.

In constructing a bell according to my invention I take a disk of steel of suitable thickness and diameter and form in it a central opening 5 for attaching the bell in position

for ringing or for connecting a handle thereto. The opening 5 may also be used as a guide for centering the plate in the dies during the several steps employed in forming the bell. The above-mentioned disk is heated and placed in the first set of dies and partially shaped or dished, starting at the periphery of the disk, and by successive sets of dies, gradually decreasing in size, the dishing is continued until the complete bell is formed, having walls of varying thickness. By reference to Fig. 1 the top portion of the bell, included in the space marked 1, is shown as retaining the original thickness of the steel disk, the action of the dies merely bending or dishing the metal at this portion. The next section of the bell, included in the space marked 2, is of less thickness than the original plate, the dies being so formed as to suitably bend the metal and at the same time stretch it and reduce its thickness. The next portion of the bell immediately below, and included in the space marked 3, is of greater thickness than the original plate, the dies being so constructed as to stave the metal or increase its thickness at this point. The bottom portion of the bell, included in the space marked 4, has the greatest thickness, the dies operating in shaping this section to stave the metal about the periphery of the bell.

By constructing a bell after the manner just described it will be found that a better tone and a larger volume and prolonging of the sound are obtained. The reduced thickness of the metal of the section 2 permits the heavy body of metal below it to vibrate freely, prolonging the sound and increasing its volume, and the uniformity in thickness in corresponding portions of the bell render the tone clearer than in cast-metal bells.

I claim—

1. As a new article of manufacture, a pressed-steel bell having the upper portion of its sides of one thickness of metal, its lower or peripheral portion of a greater thickness than the upper portion, and an intermediate portion of less thickness than the upper portion; substantially as described.

2. As a new article of manufacture, a pressed-steel bell having the upper portion of its sides of one thickness of metal, its lower

or peripheral portion of a greater thickness
than the upper portion, a portion adjoining
the upper portion less in thickness than said
upper portion, and a portion adjoining the
5 lower portion of less thickness than said lower
portion; substantially as described.
In testimony whereof I have hereunto af-

fixed my signature in the presence of two sub-
scribing witnesses.

JOHN T. DUFF.

Witnesses:
C. C. LEE,
O. D. LEVIS.