

(No Model.)

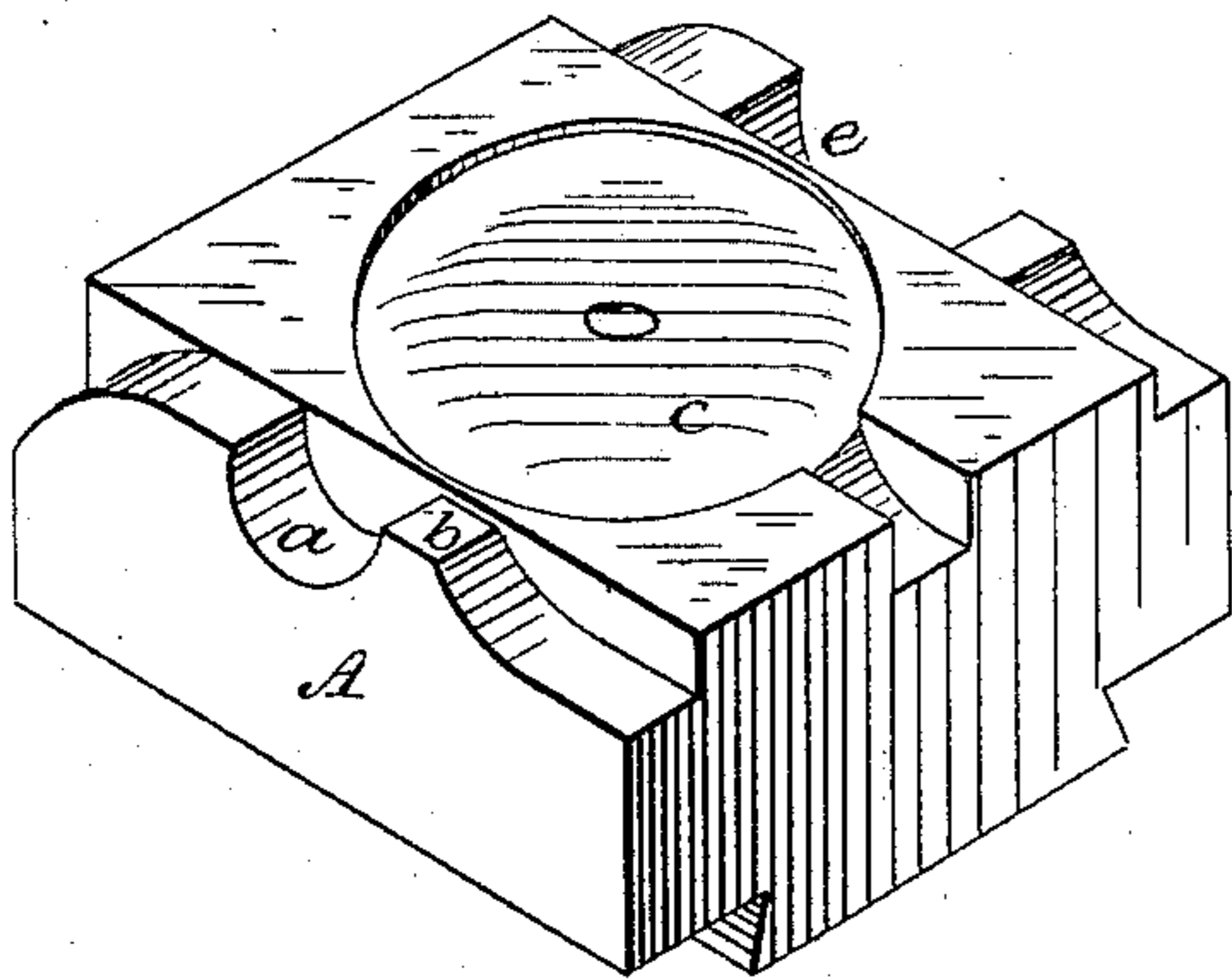
2 Sheets—Sheet 1.

H. T. RUSSELL.  
DIE FOR MAKING BELLS.

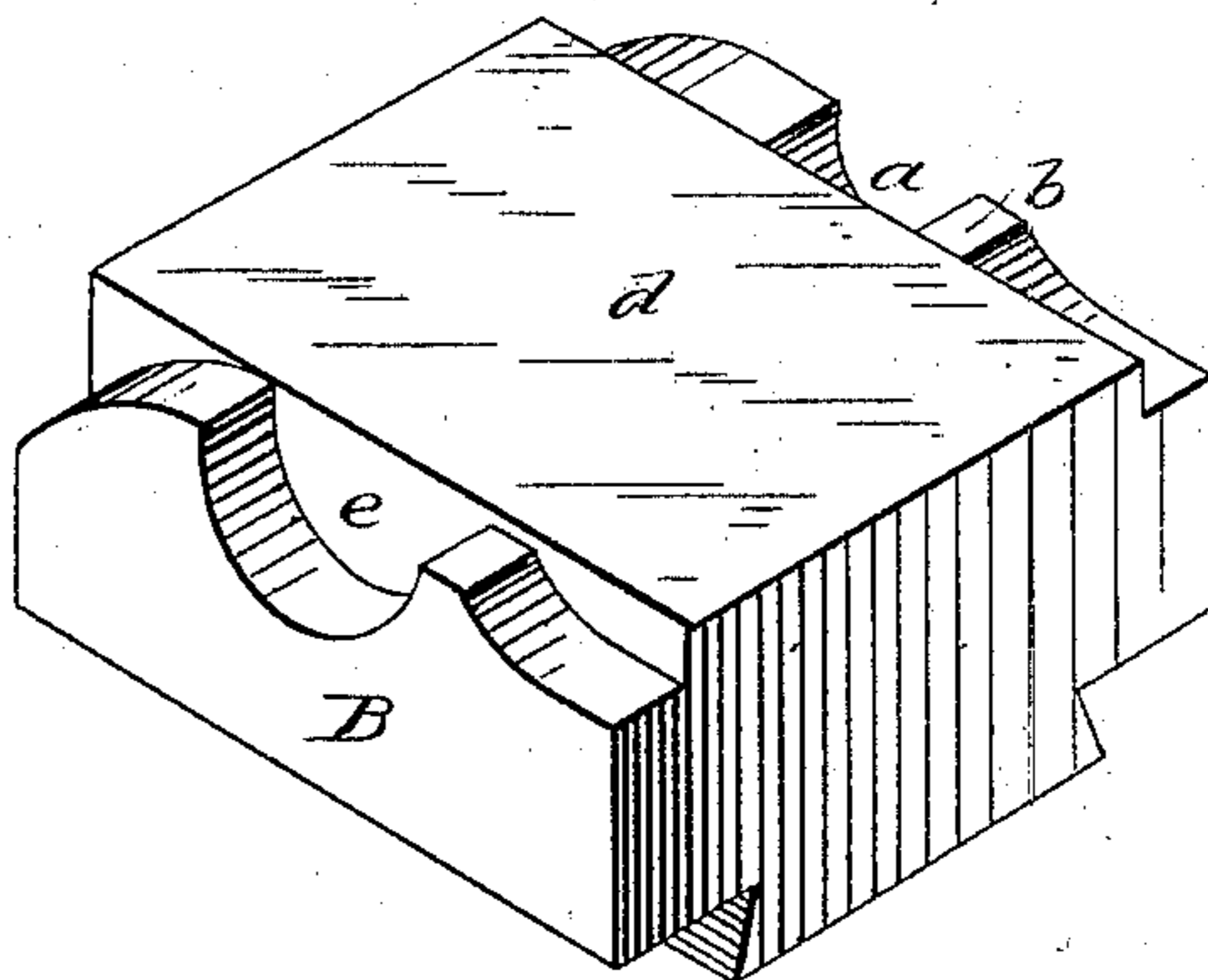
No. 316,489.

Patented Apr. 28, 1885.

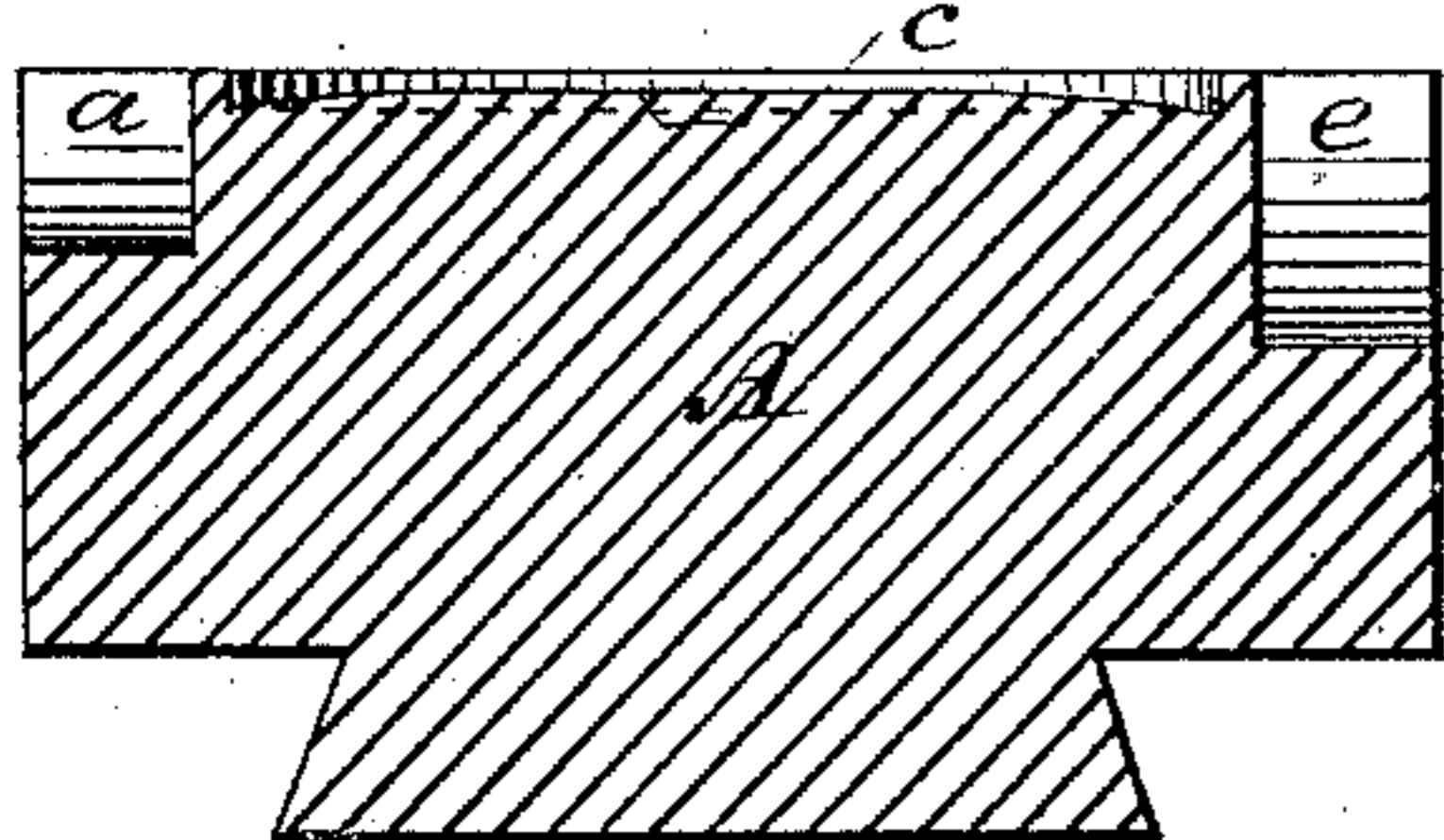
*Fig. 1.*



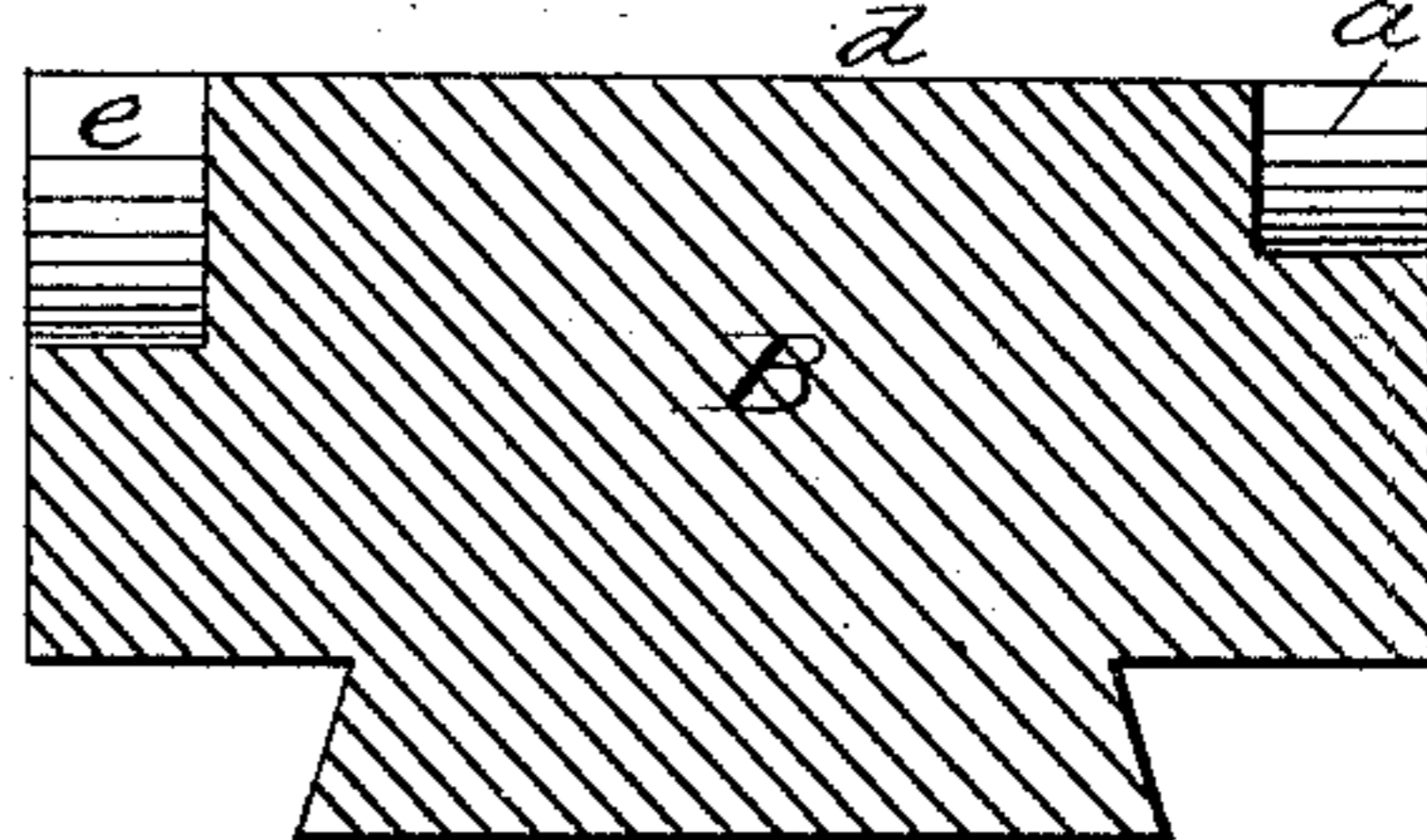
*Fig. 2.*



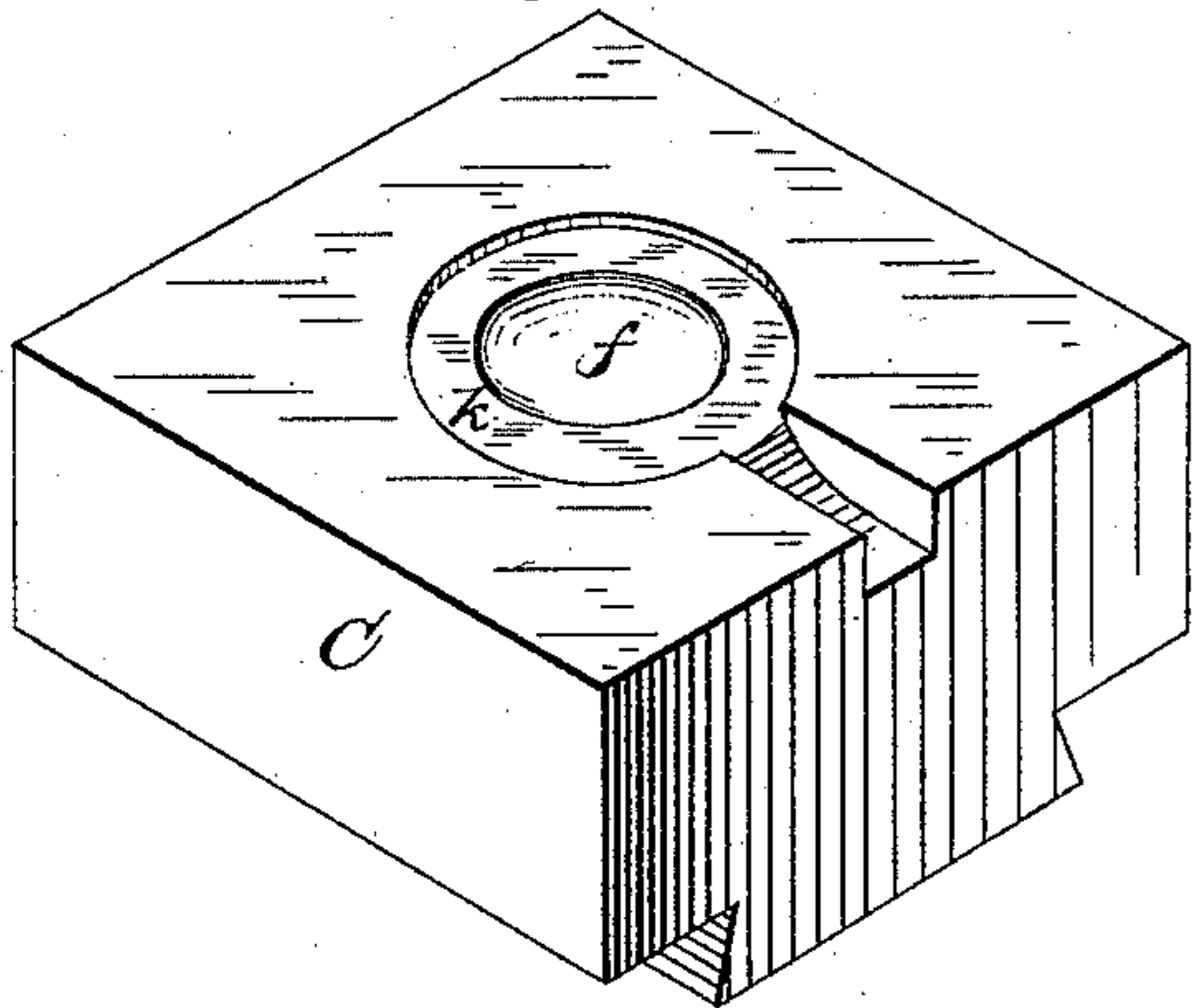
*Fig. 3.*



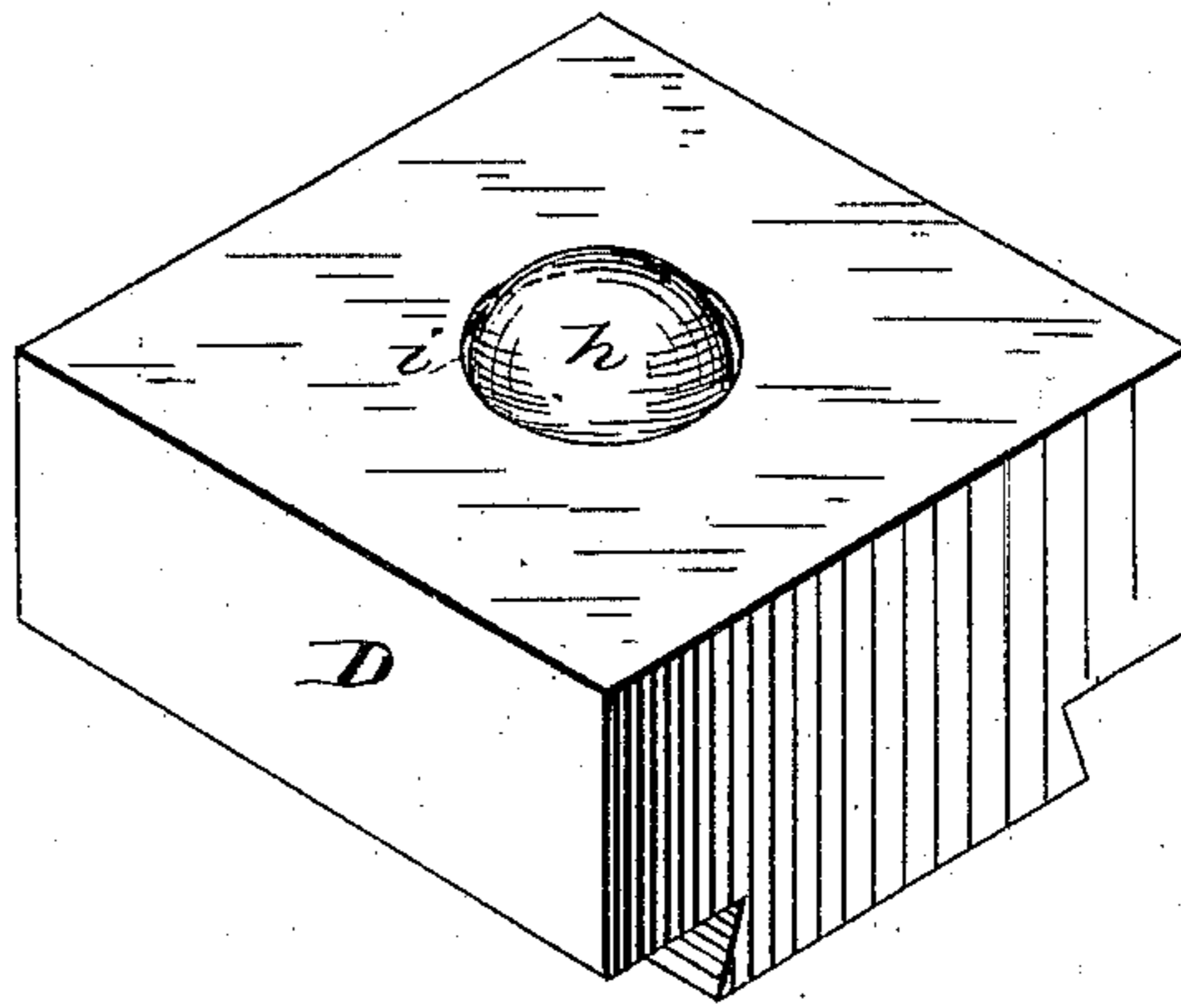
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses:

J. C. Brecht,  
David Need

Inventor:

Henry T. Russell  
By Wm. D. McArthur  
Attorney.

(No Model.)

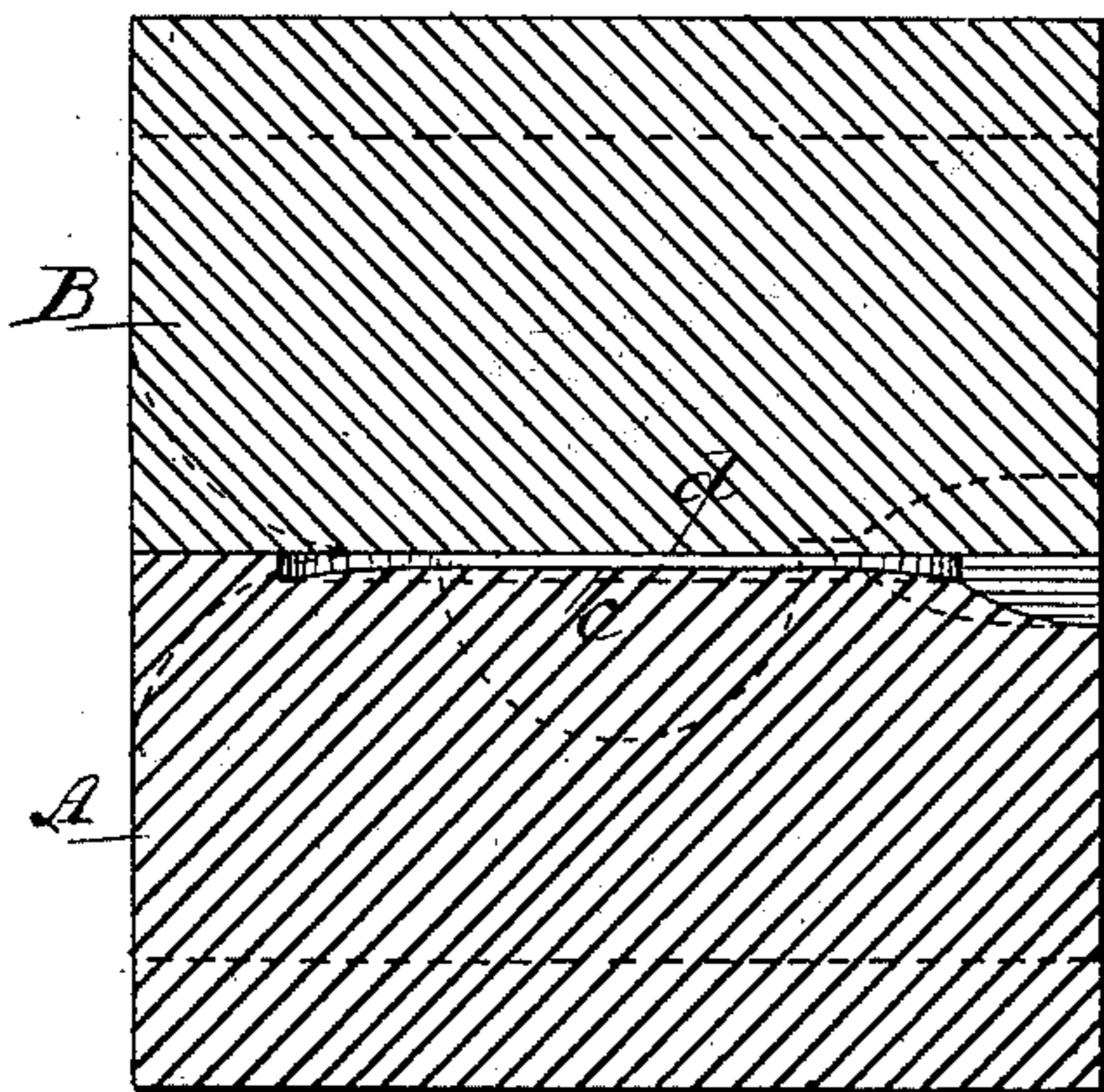
2 Sheets—Sheet 2.

H. T. RUSSELL.  
DIE FOR MAKING BELLS.

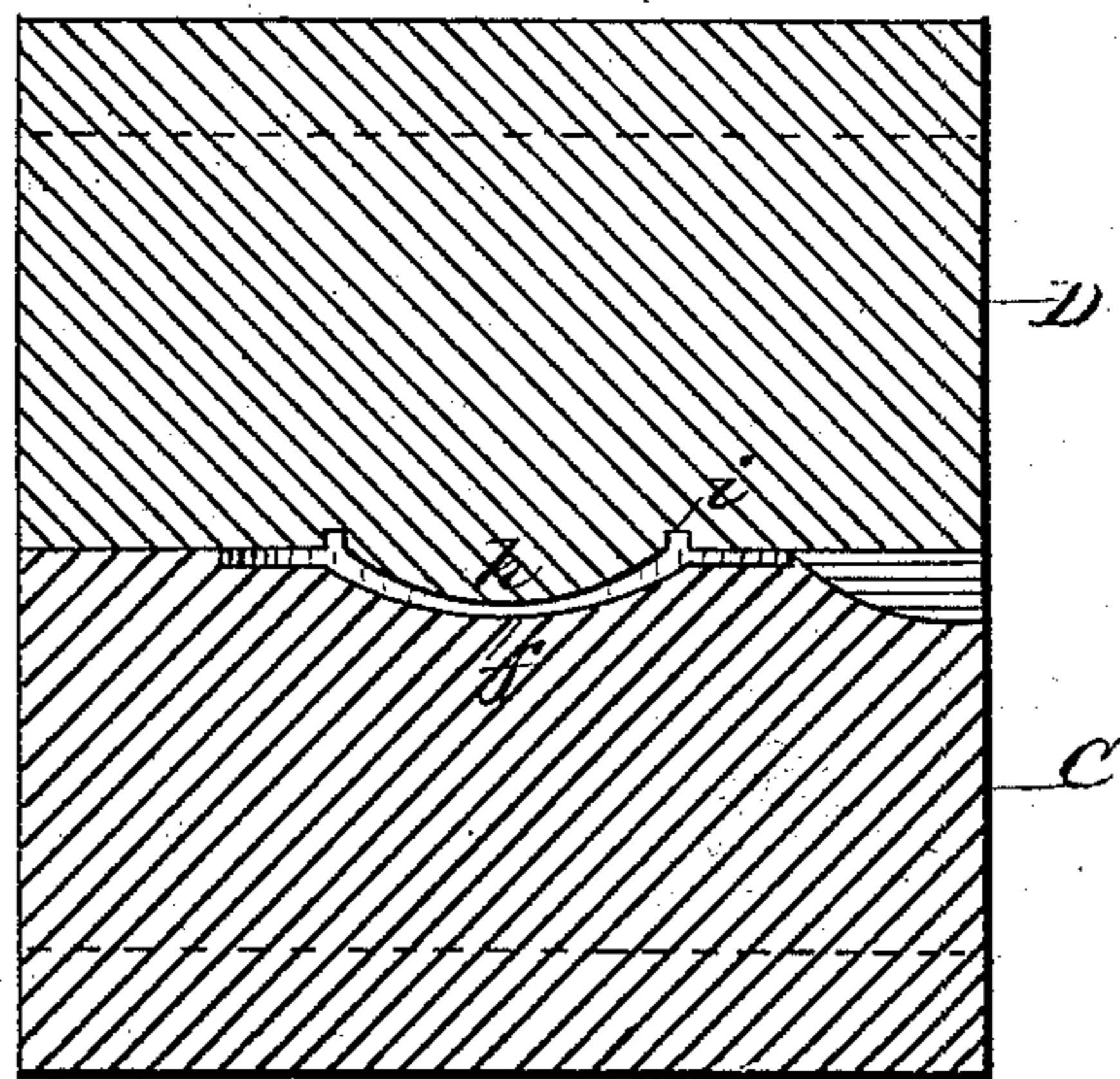
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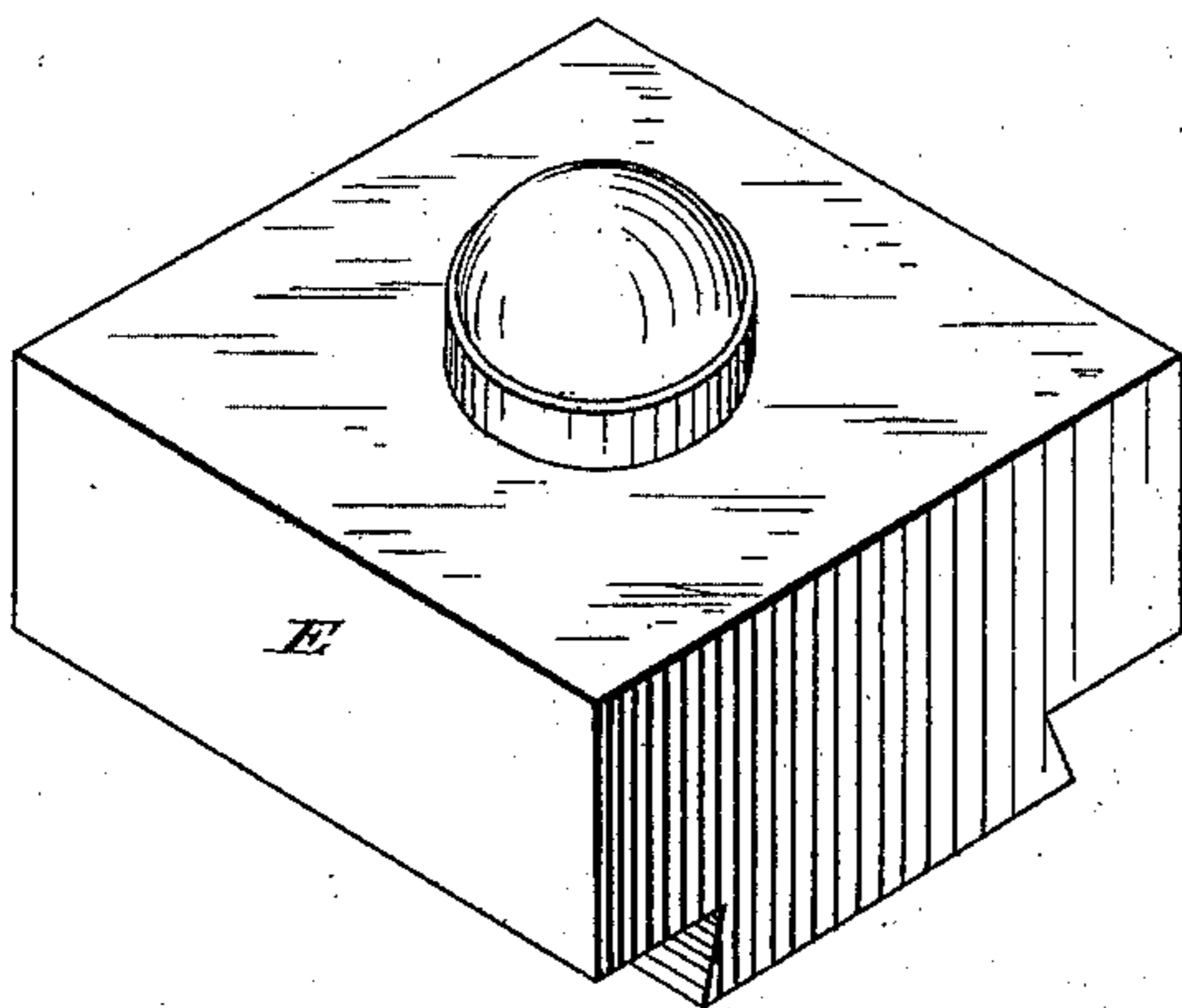
*Fig. 7.*



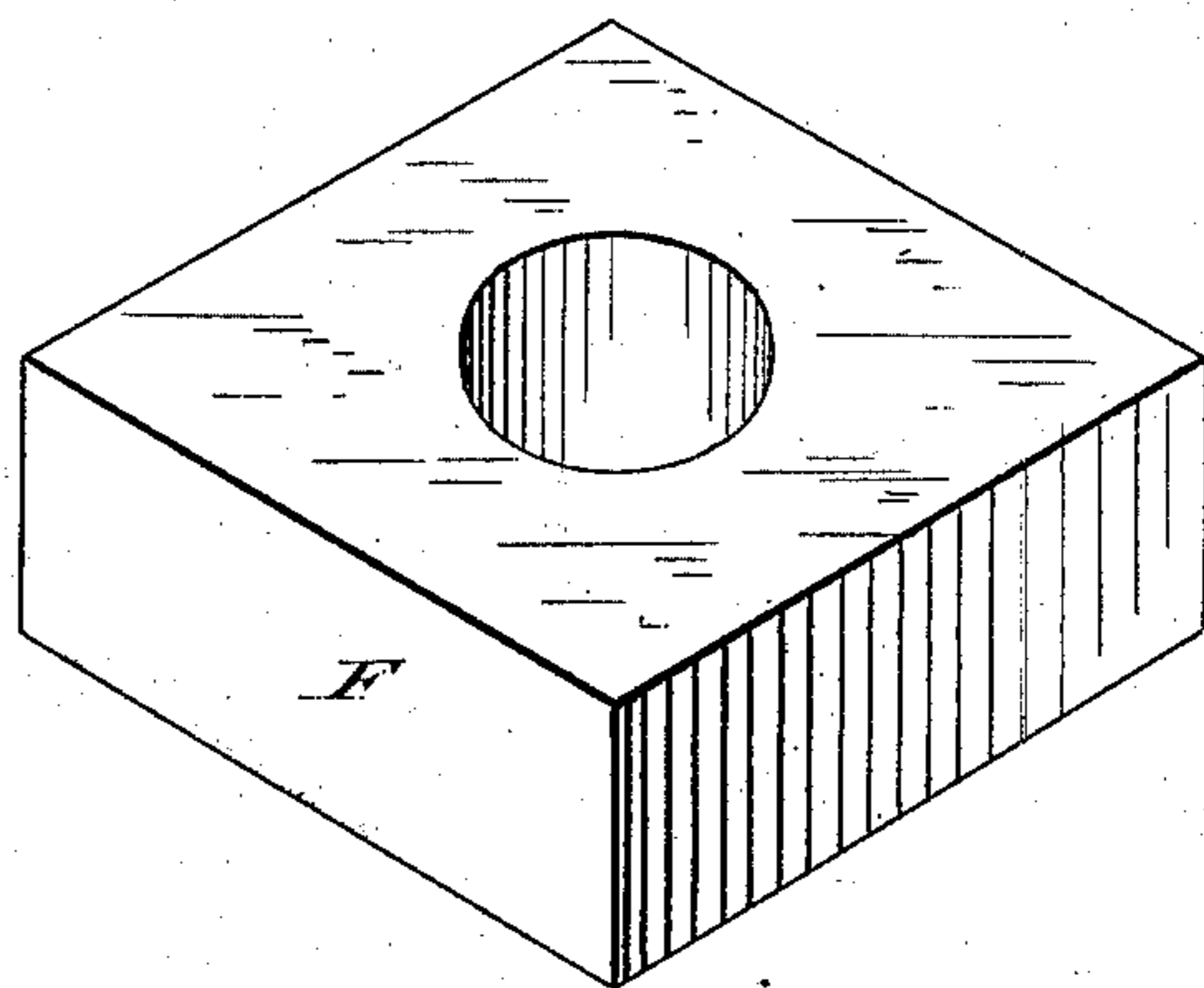
*Fig. 8.*



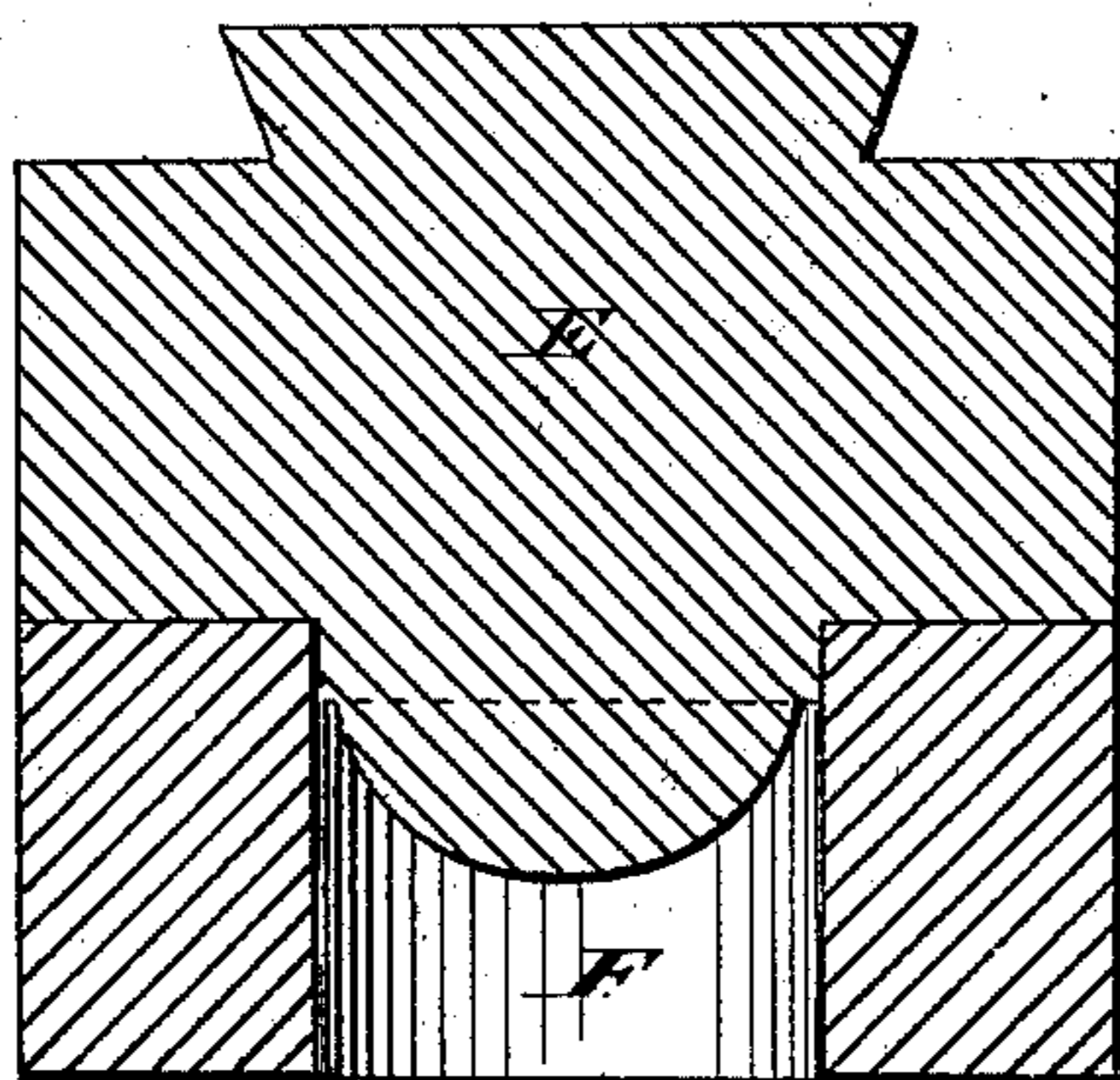
*Fig. 9.*



*Fig. 10.*



*Fig. 11.*



Witnesses:

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# UNITED STATES PATENT OFFICE.

HENRY T. RUSSELL, OF CHICAGO, ILLINOIS.

## DIE FOR MAKING BELLS.

SPECIFICATION forming part of Letters Patent No. 316,489, dated April 28, 1885.

Application filed September 12, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY T. RUSSELL, a citizen of the United States, residing at Chicago, Illinois, have invented new and useful Improvements in Apparatus for Manufacturing Bells, of which the following is a specification.

My invention relates to certain new and useful improvements in apparatus for the manufacture of gong-bells from a bar of metal.

10 The object of the invention is to produce an apparatus for the manufacture of bells by means of which the required amount of metal is separated from the bar of material of which it is formed, the application of succeeding parts  
15 of the said apparatus gradually causing it to assume the desired form of bell possessing the most desirable form and proportion, conducing to the formation of the bell in such form as to do away with the subsequent step  
20 of filing the edge to give them the form necessary to produce a bell which will give a clear sound, and also forming a projection or nib upon the outer convex surface possessed of an opening which may be slightly screw-threaded  
25 or easily perforated, and thus adapted for attachment.

With these objects in view my invention consists of a series of male and female dies of a peculiar form, adapted for use consecutively  
30 to accomplish the gradual formation of the bell, beginning with the separation of the required amount of metal from the bar, and terminating with the act of removing the superfluous metal from the edge of the nearly-completed bell.

In the accompanying drawings I have illustrated what I consider the best form of dies to be used in making the bells.

In the drawings, Figures 1 and 2 represent  
40 perspective views of the first pair of dies used in the process. Figs. 3 and 4 represent central cross-sections of the dies shown in Figs. 1 and 2. Figs. 5 and 6 represent perspective views of the second pair of dies used in the  
45 process. Figs. 7 and 8 represent central cross-sections, respectively, of the first and second pairs of dies in operative position. Figs. 9 and 10 are perspective views of the members of the third pair of dies, and Fig. 11 is a central vertical section of this third pair of dies  
50 as they appear in operation.

In carrying out my invention, the end of a

bar, preferably steel, is heated to the temperature required to render it easily manipulated, and inserted into the space *a* in the die A, and the die B brought down upon it by any suitable mechanism, and thus the required amount of metal necessary in the formation of a bell is divided from the bar by a small neck which is formed in the neck *b*. The purpose of this  
60 part is to form a connection between the metal of which the bell is formed and the bar of material, to facilitate the handling during this and subsequent steps of the process of formation.

Experience has shown that it is of great advantage to give the blank a form approximating to what it is designed to assume finally as soon in the process as possible, so that the form may be imparted gradually, and thus avoid  
70 injury to the metal caused by sudden and radical change of form. Therefore, after the desired quantity of material has been separated from the main bar, it is laid upon the surface *c* of the female die A, and the plane surface  
75 *d* of the die B brought down upon it with sufficient force to reduce it to about half its thickness. The surface of this die is, as will be seen upon an inspection of Fig. 3, so formed as to have its outer portion slightly more be-  
80 low the surface of the die than the inner portion. The object of this form is to give the metal of which the bell is formed a greater thickness at and near the edges than near the center as early in the process as possible.  
85 After being struck a blow by the blocks B the flattened part is put into the space on the side of the die A, and a blow given which is sufficient to gather the metal into a compact body having smooth edges. From this form the  
90 blank is taken and placed again upon the surface *c*, and given another blow, the effect of which is to flatten it out to the width necessary for making the bell. After being given the necessary diameter and thickness of metal  
95 the blank is put upon the portion *f* of the die C, and its fellow die D brought down so as to bring the portion *h* of that die to come over the said hollowed part and press the metal into the form of that die. The projection on  
100 the die D is provided around its base with a channel, *i*, of the form which it is desirable that the edge of the bell should possess when completed. Thus it will be seen that after re-

ceiving the impact of the die D the blank has assumed the form of a completed bell, with the exception of the presence of a circular rim of waste material. During the pressure of the two dies C and D this superfluous metal is contained in the circular sunken channel *k*. As a simple means of removing this superfluous material from the edge of the bell, I employ the pair of dies E and F. The lower die, F, is provided with a central circular opening of a diameter precisely the same as that of the completed bell, so that when the said bell is forced down through the opening prepared for it all the material beyond the square edge is carried away. The male die which forces the bell down into the opening is of a form coincident with the contour of the inside of the bell, and has a flange around this curved part of a width corresponding with the thickness of the metal of the bell, and thus is formed a seat for the bell as it is forced down into the female die. This operation completes the bell by removing all the superfluous metal, and leaves the bell with a plain edge.

Having thus clearly described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An apparatus for the manufacture of gong-bells, consisting of three pairs of dies, one of the first pair having a sunken curved surface upon which the blank is forced by its fellow, the second pair of dies having upon

one of the members a hollow of the form which the bell is to assume, and provided with a channel for the reception of superfluous material, the male die being of a form to force the metal into the female die, and the third pair of dies consisting of a female die having an opening of a diameter equal to the circumference of the completed bell and a male die of a shape to conform to that of the bell, adapted to force the bell into its fellow and free it from the superfluous material.

2. In an apparatus for forming bells from a bar of metal, the dies A and B, having the side openings, and the former having the upper sunken convex portion, *c*, substantially as described.

3. In an apparatus for the formation of gong-bells from a bar of metal, the combination, with the die A, having the side openings of different diameters, and the upper convex surface of greater depth at its edges, of the die B, having similar side openings and a plane lower surface adapted to be forced down upon the die A, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY T. RUSSELL.

Witnesses:

ADELBERT HAMILTON,  
EUGENE S. BEAN.