

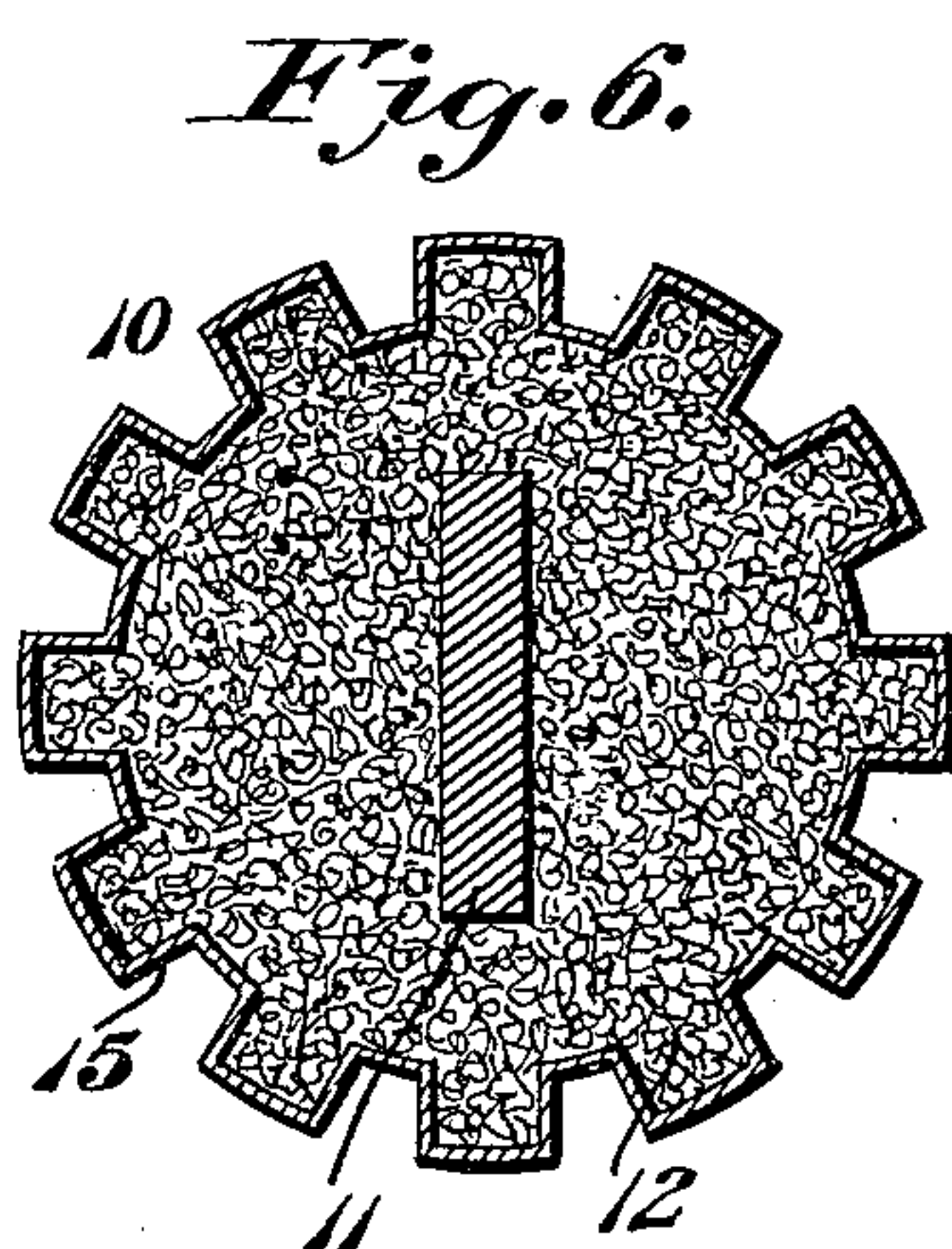
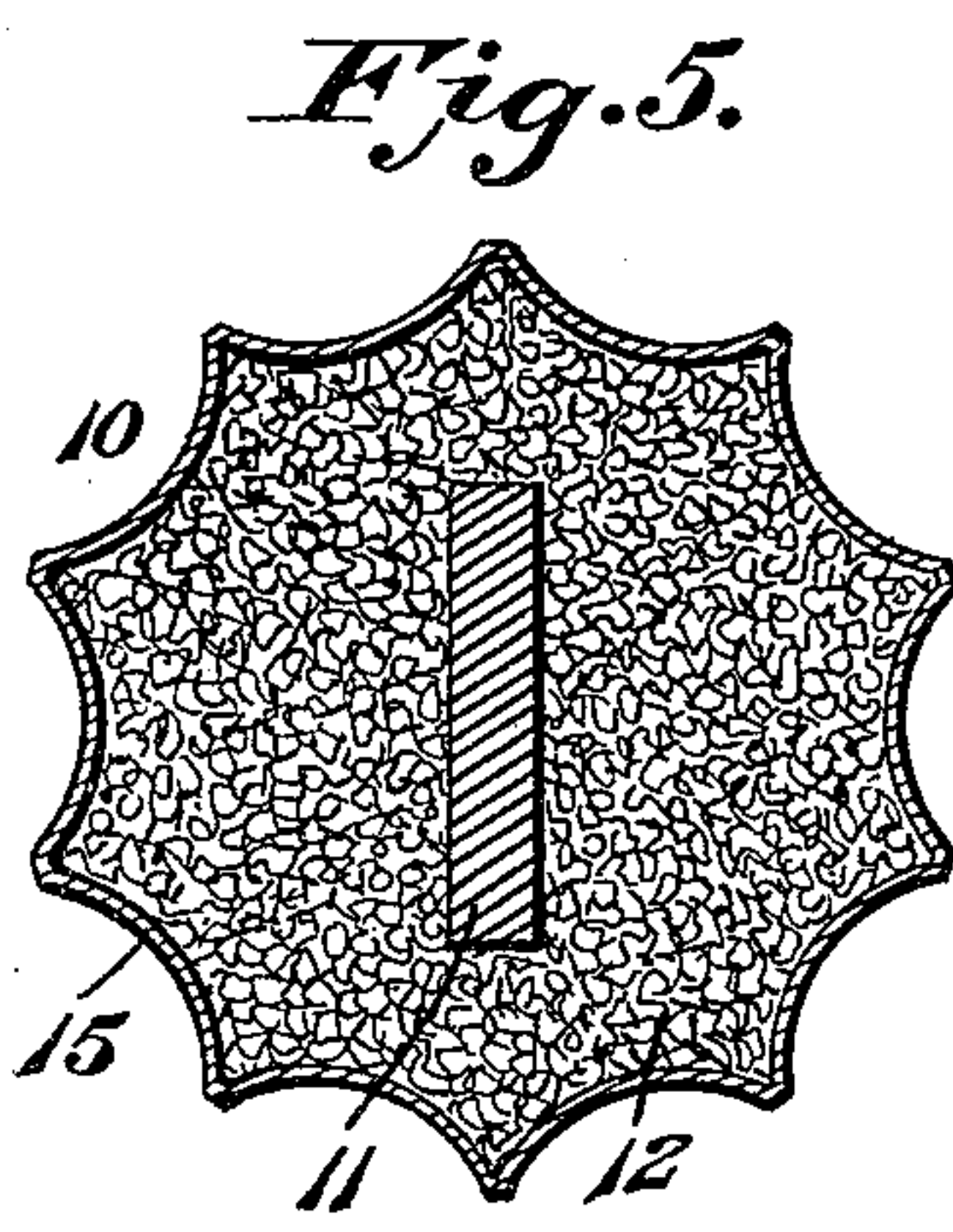
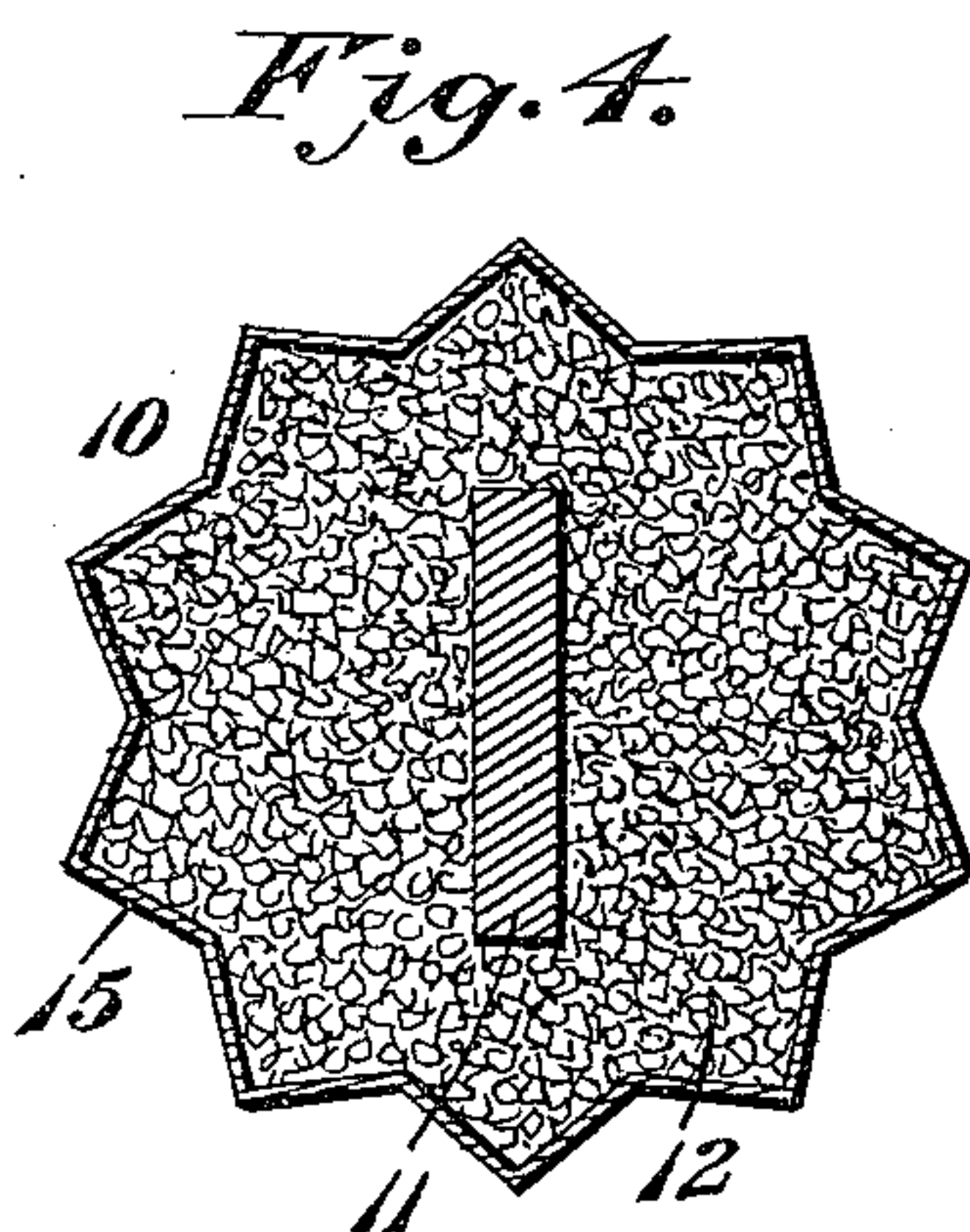
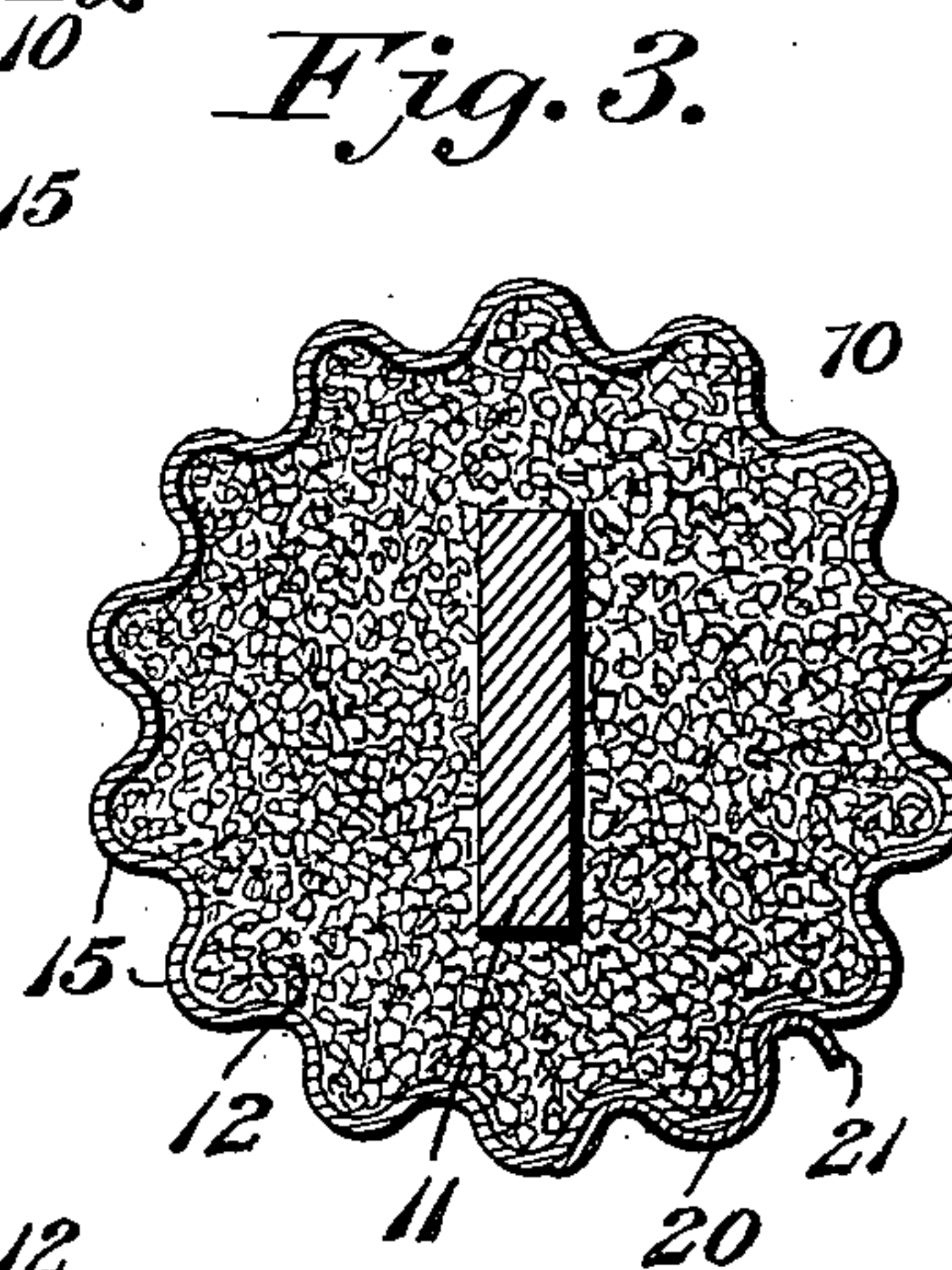
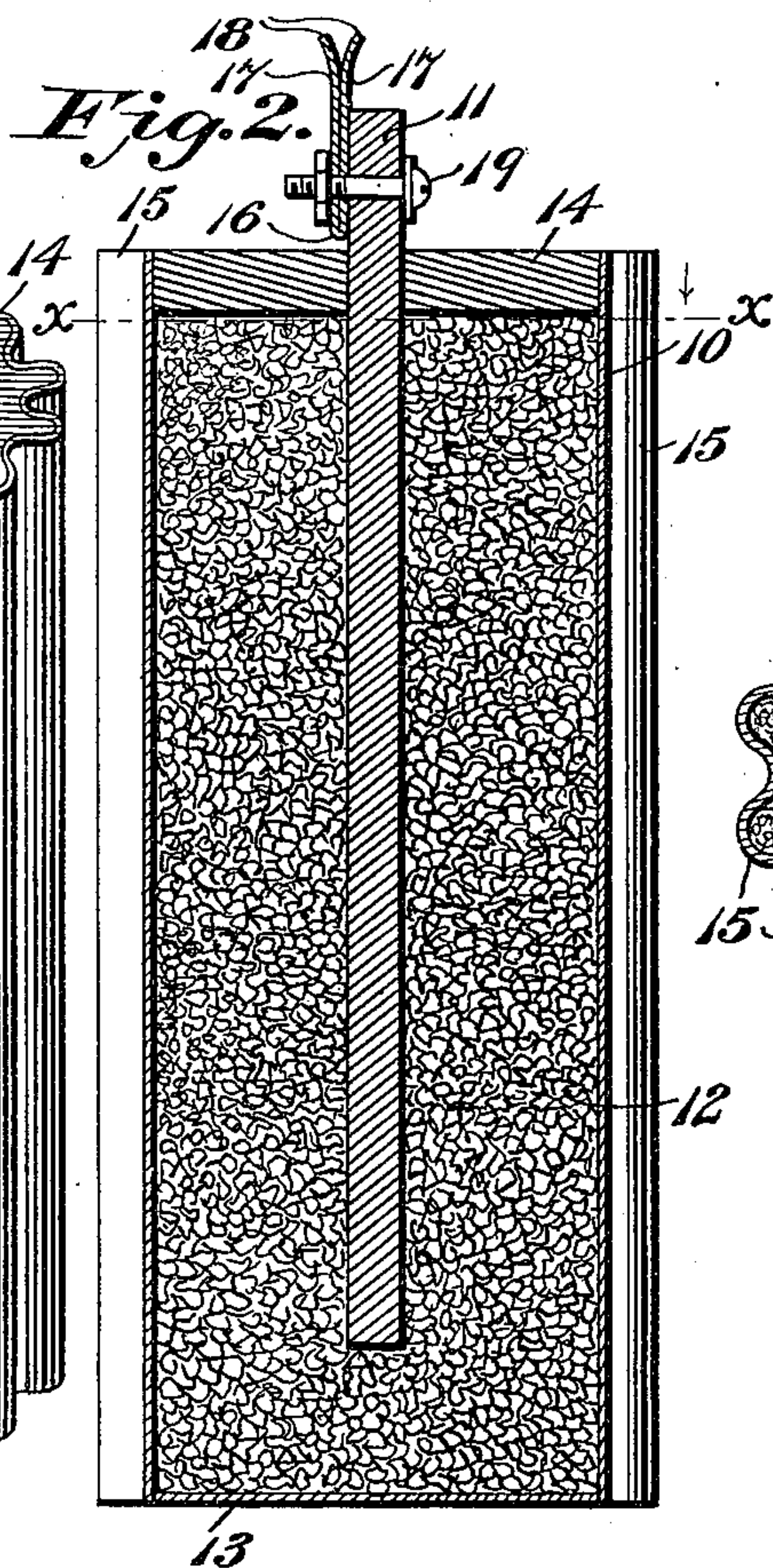
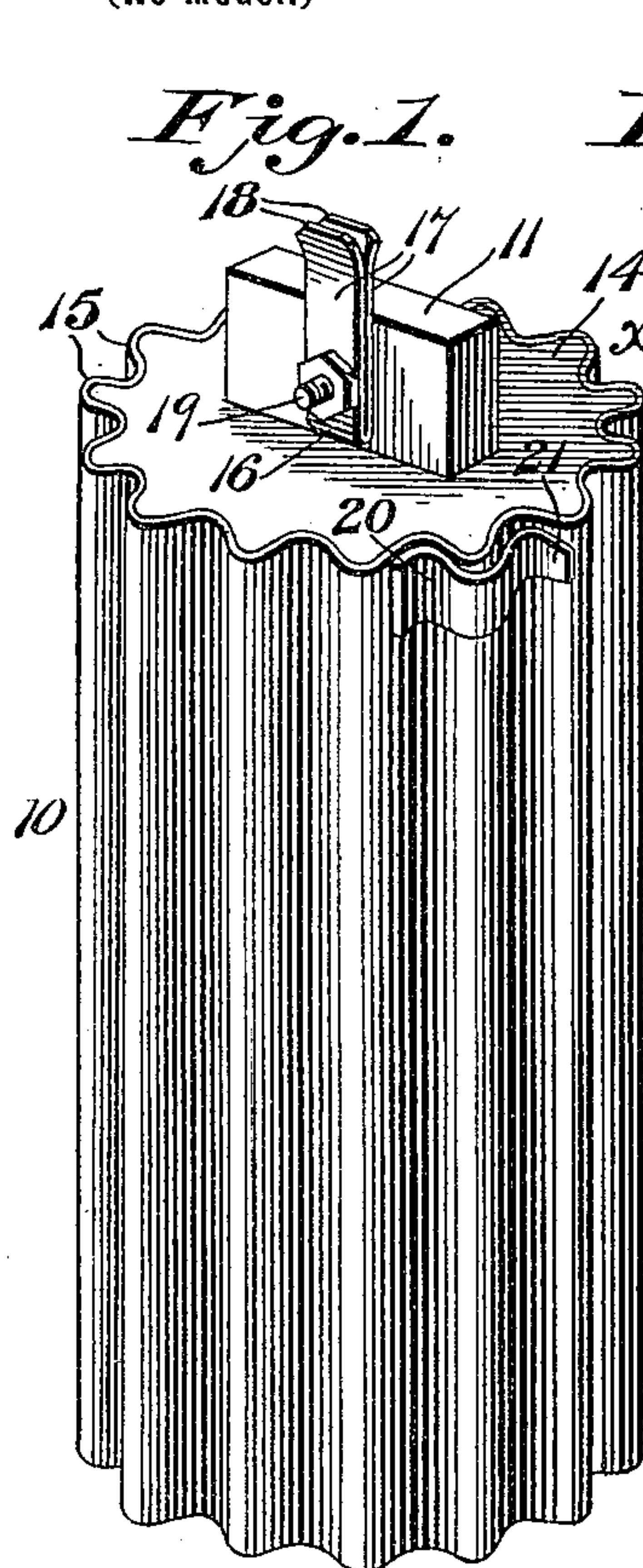
No. 653,590.

Patented July 10, 1900.

E. R. POST.  
PRIMARY BATTERY.

(Application filed Feb. 5, 1900.)

(No Model.)



EDWARD R. POST

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By

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# UNITED STATES PATENT OFFICE.

EDWARD R. POST, OF NEWBURG, NEW YORK.

## PRIMARY BATTERY.

SPECIFICATION forming part of Letters Patent No. 653,590, dated July 10, 1900.

Application filed February 5, 1900. Serial No. 4,018. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD R. POST, a citizen of the United States, residing at Newburg, in the county of Orange and State of New York, have invented a new and useful Battery, of which the following is a specification.

This invention relates to electric batteries, particularly to that class known as "dry" cells; and one object of the invention is to provide a novel construction of the positive element to permit of its use as the outer casing of the battery, and also provide a strengthening of the element and a greater surface area without increasing the circumference.

A further object is to provide improved means for securing the wires or conductors to the battery elements, whereby better contact is secured and in a more convenient manner than with the ordinary binding-post.

The preferred form of the invention is described in the following specification and shown in the accompanying drawings, which form a part thereof, and in which—

Figure 1 is a perspective view of a dry battery constructed in accordance with the invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a horizontal cross-section on the line  $x x$  of Fig. 2. Figs. 4, 5, and 6 are slight modifications showing different forms of corrugations that may be used.

In the drawings similar reference-numerals refer to similar parts throughout the several figures.

The positive element, which may be any of the well-known substances used for this purpose, but is preferably zinc, serves as the casing for the cell and is designated by the numeral 10. The negative element, which is arranged centrally within the casing and projects above the top edge of the same, is designated by the numeral 11. The exciting material, in which the solution by means of zinc oxychlorid, gypsum, a gelatinous mass, or by any other means is made practically solid, is arranged in the casing around the negative element and is designated by 12. The casing 10 is provided with a flat bottom 13, which is made of the same material as the walls. A suitable non-conducting compound 14, arranged in the top, holds the negative

element in proper position in the casing and provides a cover over the exciting material.

The walls of the casing are provided with longitudinal corrugations 15, which greatly increase the surface area of the positive element, thereby allowing a greater amount of the exciting material to come into contact with the same, with a consequent increase of generating power. While the corrugations, as shown in Fig. 3, are preferably of semi-circular form, I have shown in Figs. 4, 5, and 6 modifications by which the same result may be obtained. Fig. 4 shows a triangular folding, Fig. 5 oval or elliptical corrugations, and Fig. 6 angular or "Grecian-chain" fold. It will be understood that still other forms may be resorted to, if desired. A further and very important advantage of providing the corrugations resides in the rigidity and strength they impart to the casing, whereby it is enabled to withstand rough usage or accidental blows, which in the ordinary dry cell often seriously impairs or destroys its electrical action by changing the shape of the cell and causing the excitant to fall away from the positive element.

I am aware that it is old to provide the carbon of a wet battery in the form of a cell with corrugated walls and do not claim any invention therein; but my invention relates to improvements in dry batteries and presents many advantages over a corrugated carbon element. In the first place a carbon element is brittle and is liable to fracture. Again, on account of its porosity it would permit the rapid evaporation of the moisture, which must be contained in proper percentage in the existing material of a dry battery. For this reason I construct my battery-case of a positive sheet metal which will exclude the air, and thereby retain the moisture. I corrugate this metal to produce a greater surface, for the reason that the output of the dry battery depends upon the amount of positive element consumed, and I thereby greatly prolong the life of the battery.

The upper end of the negative element 11, which projects above the top of the casing, is provided with a binding post or spring 16. This spring, as shown, is preferably made of a single piece of flat metal bent upon itself,



forming two leaves 17, normally sprung together, the upper ends of which flare outwardly, forming two guiding-lips 18. A screw-bolt 19 passes through the leaves 17 of the  
5 spring, thereby holding the same in place and exerting the proper tension upon the spring-leaves.

At the upper edge of the positive element or casing is provided a binding-spring 20.  
10 This spring is a flat piece of metal fastened at one end in a horizontal position and conforming to the corrugations of the wall, against which it is normally sprung. The free end of this spring is bent outwardly, as  
15 at 21, and is so arranged that it forms with the corrugation a guiding-opening, by means of which a conductor-wire may be easily forced under the same. It will thus be seen that these two binding-springs form very con-  
20 venient means for applying and detaching the conducting-wires and that they securely hold the same in operative contact. Ordinarily the casing 10 is provided with a protective coating or covering, which is preferably shellac, in which case that portion un-  
25 derneath the spring 20 will be left bared, so as to provide a good contact-surface for the conducting-wire.

I am aware that it is old in electric batteries to employ elements which are corrugated to present a greater surface area to the exciting material; but I am not aware that a longitudinally-corrugated zinc cylinder has ever been used as the outer shell or casing of  
35 a dry battery. A zinc cylinder in this form as the outer casing of a dry battery performs functions which could not be attained by the use of a plain cylindrical zinc shell. In the first place the longitudinal corrugations of  
40 the zinc cylinder impart exceptional strength thereto, so as to render the same capable of withstanding rough usage or accidental blows without seriously impairing the action of the battery. Furthermore, a longitudinally-cor-  
45 rugated zinc cylinder possesses a certain degree of resiliency which will absorb or yield to the blow without tending to materially displace the excitant within the battery. In the present invention the longitudinally-corru-  
50 gated zinc cylinder also performs important functions in connection with the bottom plate 13 and the top filling 14. The said bottom plate 13 is corrugated continuously at its edge or periphery and interlocks with the corru-  
55 gations of the zinc shell, thereby preventing the bottom plate from buckling away from the exciting material. With reference to the top filling 14 the latter is closely packed into

the corrugations at the upper end of the zinc cylinder and is protected thereby from loos- 60 ening or chipping, which is a common fault in the ordinary dry cells. In the ordinary type of cells a lateral jar upon the outer case loosens up the exciting material for a consid- 65 erable space and causes its separation away from the shell, besides permitting the carbon element to work loose and sometimes swing against the zinc shell and cause a short-cir- 70 cuiting of the battery. The present invention tends to overcome these difficulties, as the corrugations act as a clamp or binder for the exciting material to hold the latter more firmly upon the carbon, besides preventing its ready separation away from the zinc shell.

It will be understood that various changes 75 in the form, size, and minor details of construction within the scope of the appended claims may be made without departing from the spirit or sacrificing any of the advantages of the invention. 80

Having now fully described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a dry battery, the combination of a positive zinc element in the form of a cylin- 85 der, constituting the outer shell or casing of the battery and provided with continuous longitudinal corrugations extending from end to end thereof, a bottom plate provided with a continuously-corrugated edge received by 90 and snugly fitting the lower edge of the corrugated cylinder and braced thereby against buckling, a top filling packed within the upper end of the corrugated zinc cylinder and into the corrugations thereof, so as to be held 95 and protected thereby, a negative or carbon element centered within the zinc shell, and a substantially-solid exciting material packed within the zinc shell or casing about the negative element, and into the corrugations of the 100 positive element.

2. In a battery, the combination with the battery elements, one of which is of corrugated form, of a spring attached at one end to the corrugated element on the exterior 105 thereof and having its free portion fitting and conforming to the shape of said element and normally sprung toward the same, substantially as described.

In testimony that I claim the foregoing as 110 my own I have hereto affixed my signature in the presence of two witnesses.

EDWARD R. POST.

Witnesses:

HARRY McDOWELL,  
P. SAMUEL RIGNEY.