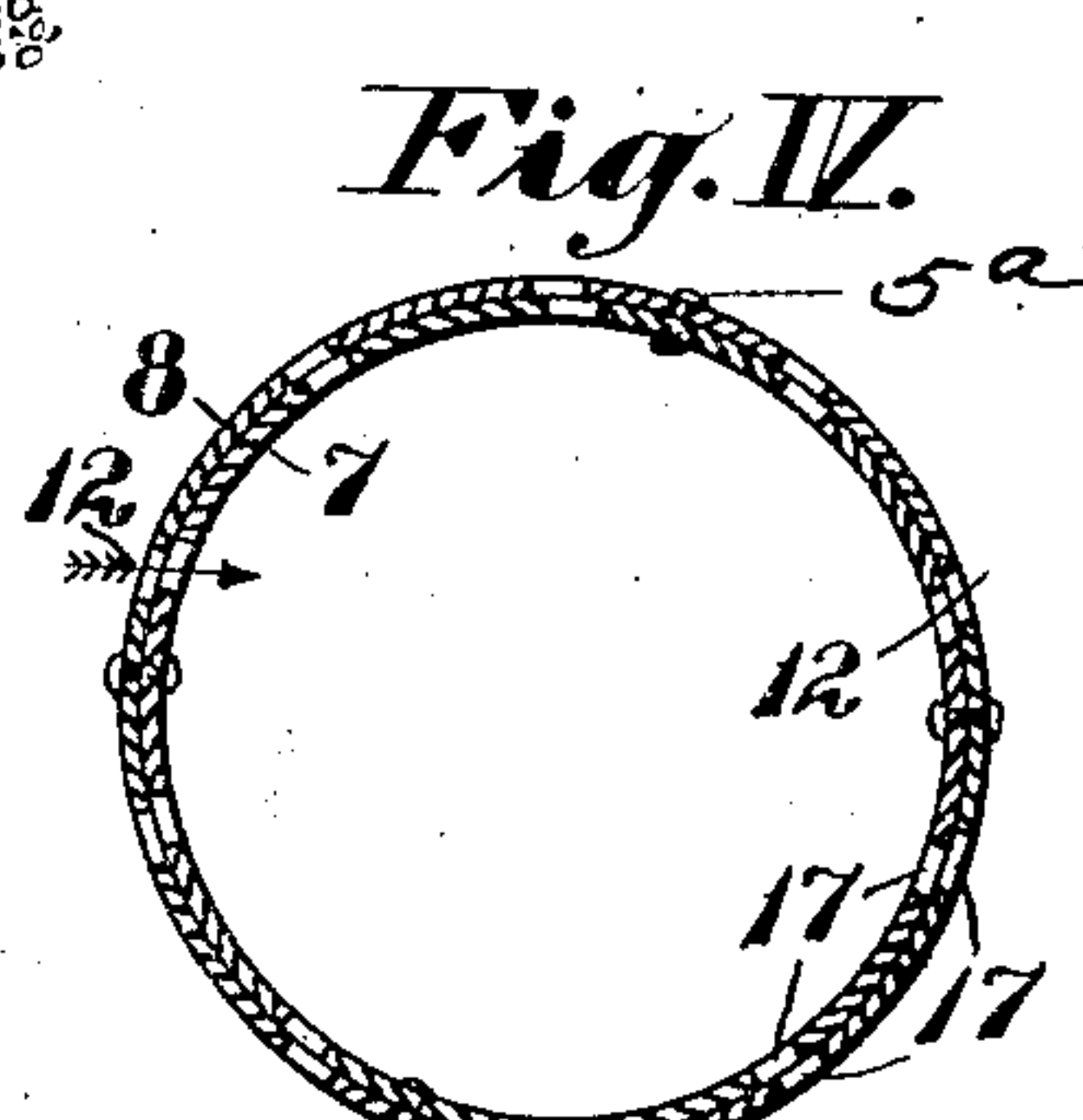
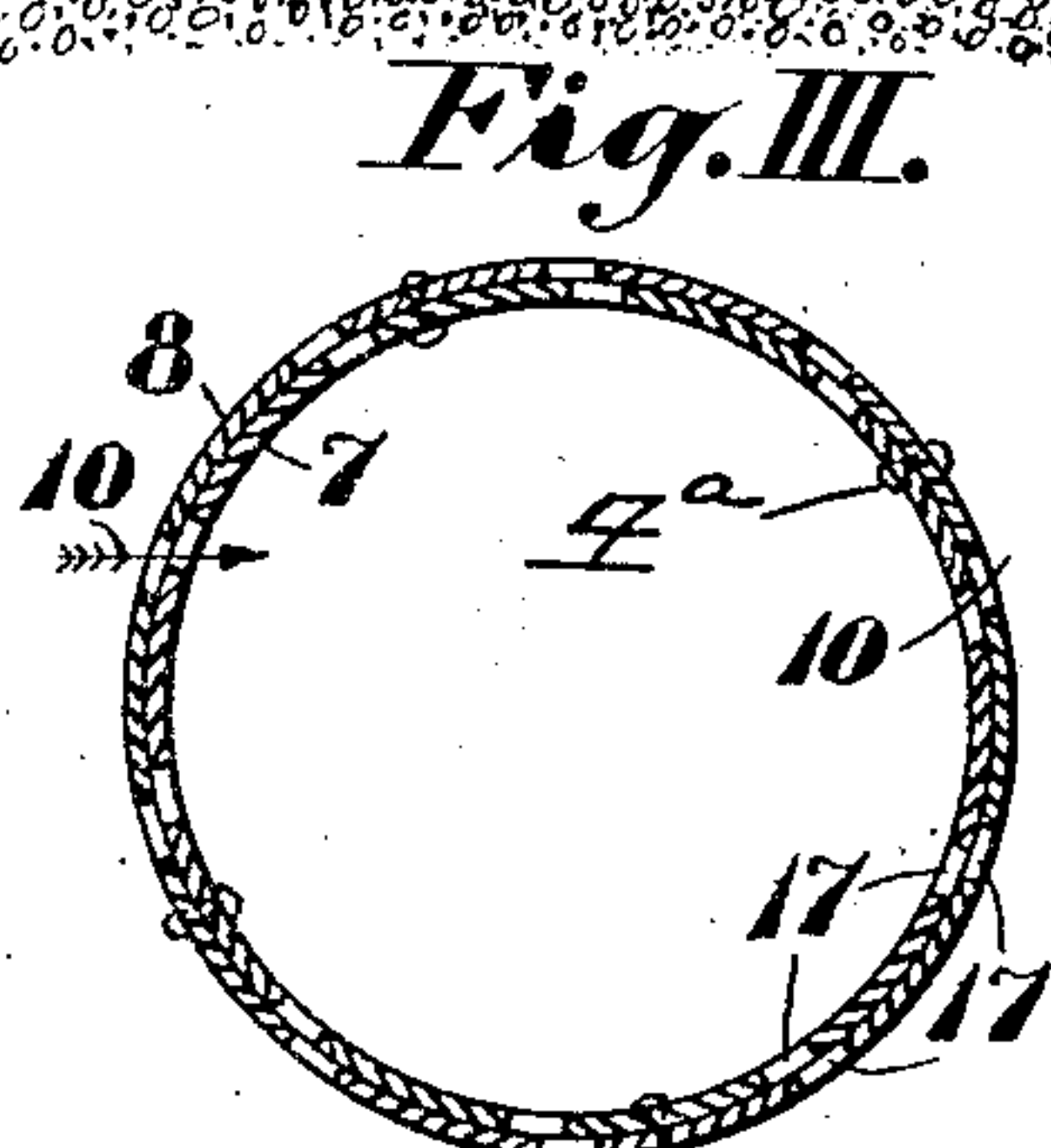
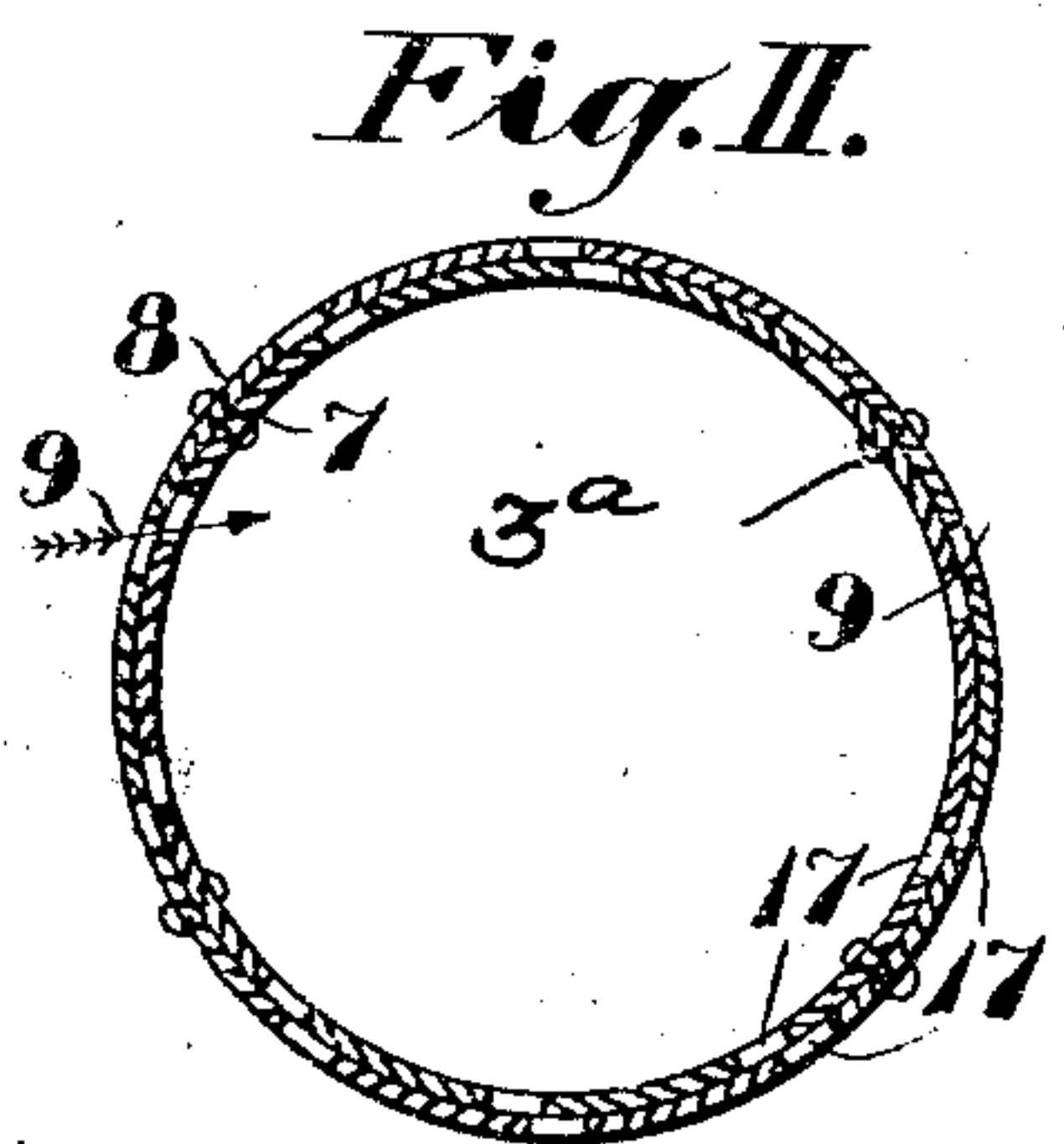
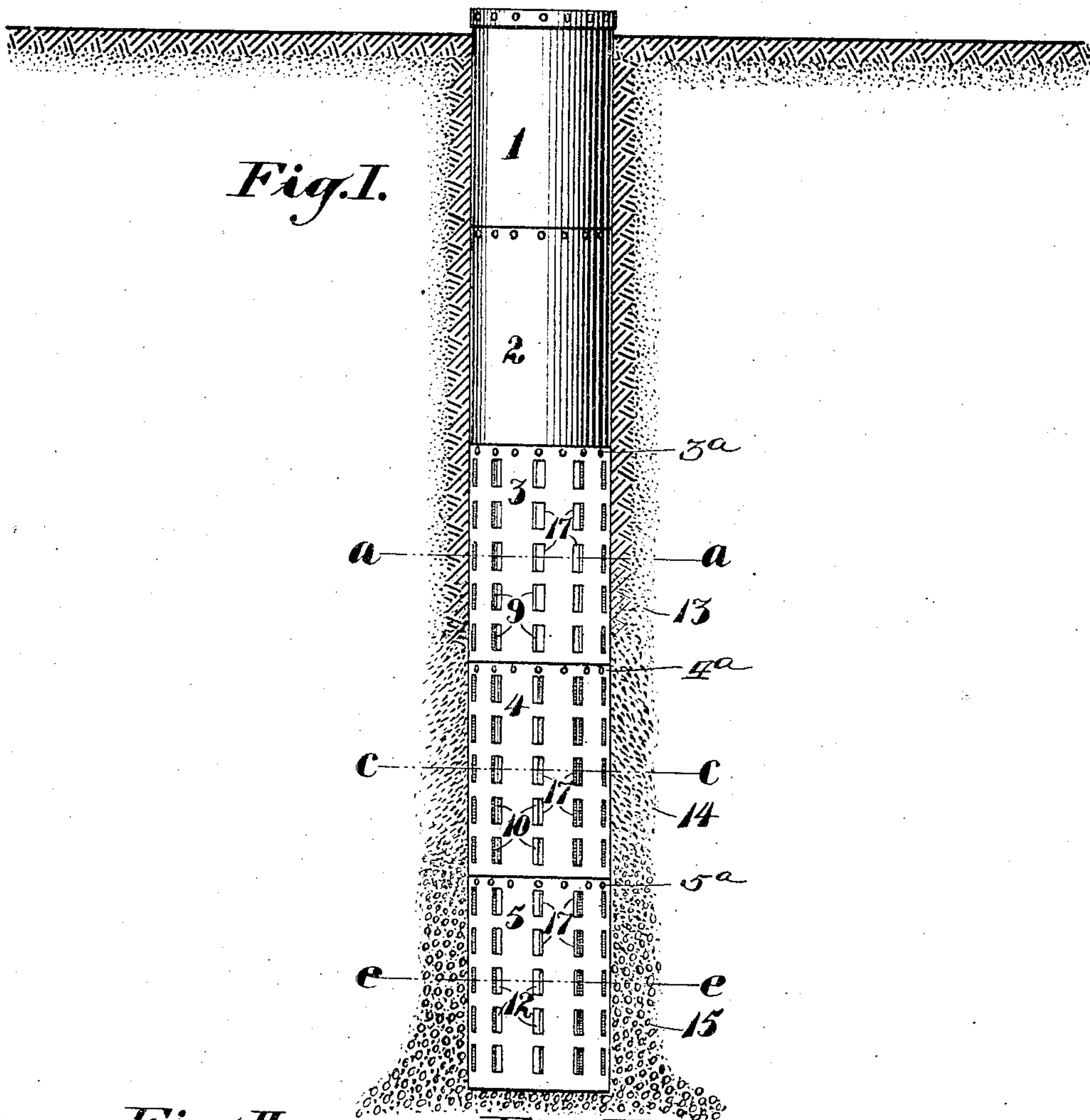


No. 884,048.

PATENTED APR. 7, 1908.

A. SMITH.  
WELL TUBING.

APPLICATION FILED APR. 4, 1906.



Witnesses:  
F. C. Fiedler.  
Elmer Wickes.

Inventor:  
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by J. Richards & Co.  
Attys.



# UNITED STATES PATENT OFFICE.

ANDREW SMITH, OF SAN MATEO, CALIFORNIA.

## WELL-TUBING.

No. 884,048.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed April 4, 1906. Serial No. 309,896.

To all whom it may concern:

Be it known that I, ANDREW SMITH, a citizen of the United States of America, residing at San Mateo, county of San Mateo, and State of California, have invented certain new and useful Improvements in Well-Tubing; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to an improved method of constructing tubing, casings or linings for wells where there is designed to be infiltration of water or oil at considerable depths, and to certain improvements therein whereby the manufacture and operation of such linings or casings are improved.

My improvement consists in providing, throughout the areas where infiltration takes place, narrow longitudinal slots or perforations that have a uniform width at all points, and so act as screens to prevent the entrance of sand, gravel or other solid substance that will clog or impede the passage of liquids through the tubes or casings; and it especially consists in a construction that permits the width of such longitudinal slots or perforations to be set or adjusted beforehand to conditions whether the tubes are designed for sand, fine gravel or coarse gravel, acting as a universal screen for all kinds of water or oil bearing strata, without other provision than simple adjustment when the sections of linings, casings or tubes are prepared for insertion.

The means consist in employing a double thickness or two walls for the infiltration sections, one fitting loosely within the other, so that by turning the outer and inner tubes relatively the width of the longitudinal perforations can be regulated and adjusted before the outer and inner pipes are fastened together, to suit the circumstances of each particular case after the water or oil bearing strata have been explored and their character determined.

The objects of my invention are to adapt the screening function of the perforations to the nature of particular strata by varying the width of the infiltration slots when the tubes, linings or casings are prepared, and to supply a standard uniform manufacture thereof. To this end I provide casings, tubes or linings for bored or drilled wells con-

structed as shown in the drawings now to be referred to, in which

Figure I shows sections of well tubing made according to my invention and sunk in the earth. Fig. II shows an enlarged transverse section through the infiltration portion of the well tubing on line *a-a* of Fig. I. Fig. III shows a similar section on line *c-c* of Fig. I. Fig. IV shows a similar section on line *e-e* of Fig. I.

In constructing casings or linings for bored wells a principal difficulty met with is in providing for the infiltration of water or oil into the tubes with the exclusion of solids that if admitted will sink to the bottom and choke the wells. Perforations to admit water or oil must be of uniform size, and when fine enough to exclude common earth or fine sand greatly diminish the inflow of water or oil from the gravel strata or other coarser material from which the principal supply is obtained. The circumstances of use therefore demand that the perforations for fluid inlets be suited to the different strata through which a well is sunk, and as fixed perforations of different sizes in each case would entail a variety of different tube sections and as the requirements can not be ascertained previous to exploring the wells and preparing the casings, tubes or linings, the defects have not hitherto been avoidable in practice. I therefore provide by means of said inner and outer walls, variable inlet ways or perforations, the required area to be attained by their length and number. They are preferably made in long, narrow longitudinal form that can be regulated to the requirements after the strata have been explored and before insertion.

In the drawing now to be referred to, 1 and 2 are imperforate sections that exclude surface water. These may be of any required number according to the nature of the soil, the depth of the well, and the liability to surface infiltration; they can also be of a single thickness or double to secure strength.

3, 4 and 5 are perforated sections to admit water or oil, each consisting of double tubes as shown in the enlarged sections in Figs. II, III, and IV.

The inner tubes 7 are made enough smaller in diameter to fit movably within the outer tubes 8, and both the outer and inner tubes are perforated uniformly and so that the apertures will register by turning the tubes one upon or within the other. When the tubes



are to be inserted in a well, the two composing each section are adjusted to produce passages 9, 10 and 12, of dimensions to suit the nature of the strata, 13, 14 and 15 in Fig. I representing earth, sand, and gravel consecutively. Such strata may be deep enough to require two or more sections in each, and the whole number of sections will be sufficient to reach to any required depth.

10 It will be understood that the tubes made according to my invention can be laid horizontally or at any required angle that may be demanded by the conditions of the strata. The apertures are first adjusted to exclude 15 the several grades of solids, as before enumerated, and the tubes 7 and 8 of each section are then fastened together by means of rivets 3<sup>a</sup>, 4<sup>a</sup> and 5<sup>a</sup> or any other suitable manner, when they are ready for insertion.

20 In this manner of constructing the pervious sections it will be seen that tubes of only two kinds are required, inner and outer, and that the perforations being uniform admits of duplicate and organized manufacture, 25 greatly reducing the varieties required and the cost of making the same.

I am aware that double walls have been employed for well tubing, especially for what are called driven or unexplored wells, and 30 that perforations for such tubes have been made adjustable from the top after insertion, or while such tubes are being inserted, but such is not my invention.

Having thus explained the nature and objects of my invention and the manner of applying the same, what I claim as new and desire to secure by Letters Patent is:

1. A casing for wells, comprising a plurality of apertured sections, each section being 40 formed with apertures of different sizes from

the apertures in the remaining sections, and each of said sections comprising a plurality of members having apertures therein so positioned as to have the apertures in said members register for forming said apertures 45 in said sections, and means for rigidly securing said sections together, said means preventing longitudinal movement of the members of said sections.

2. A casing for wells, comprising an imperforate section, a plurality of sections 50 formed with openings therein, each of said sections comprising a plurality of concentric drums, each of said drums formed with apertures therein, the registering of the apertures 55 in said drums forming the apertures in said sections, and means for holding said drums in a predetermined relation to each other and for holding said sections in position.

3. A well tubing comprising an imperforate section provided near the surface of the earth, a plurality of apertured sections, each of said apertured sections comprising a plurality of apertured cylinders of the same 65 length, one of said cylinders being positioned within the other, said cylinders contacting with each other their full length, the apertures in each of said cylinders being so placed as to form openings in said sections, each section being provided with different sized 70 apertures for accommodating various strata, and means for securing said sections together.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW SMITH.

Witnesses:

JAMES MASON,  
ELMER WICKES.