

F. S. GRAEF.
 INTERIOR MOLD OR FORM FOR CONCRETE STRUCTURES.
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983,046.

Patented Jan. 31, 1911.

Fig. 1.

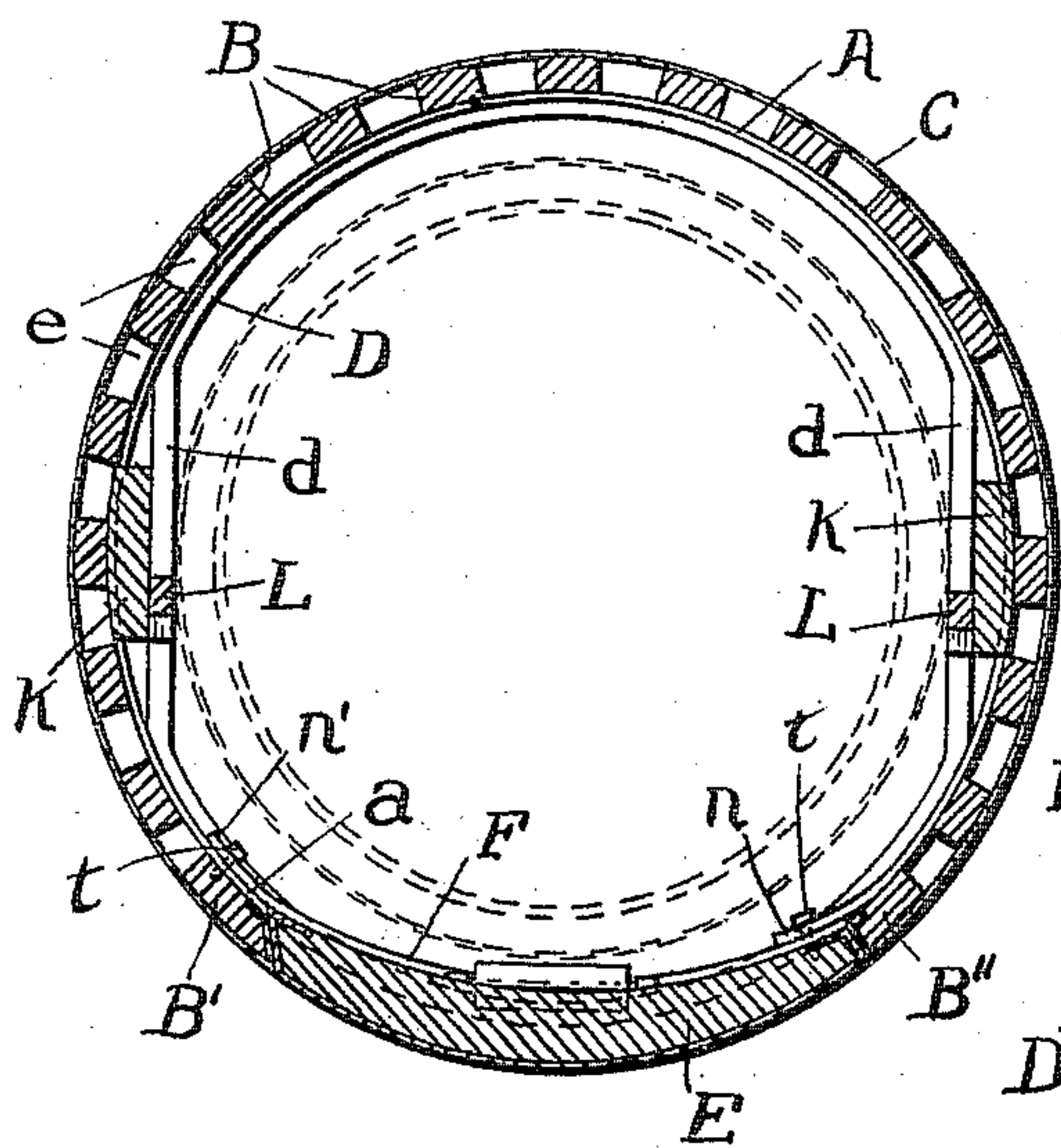


Fig. 2.

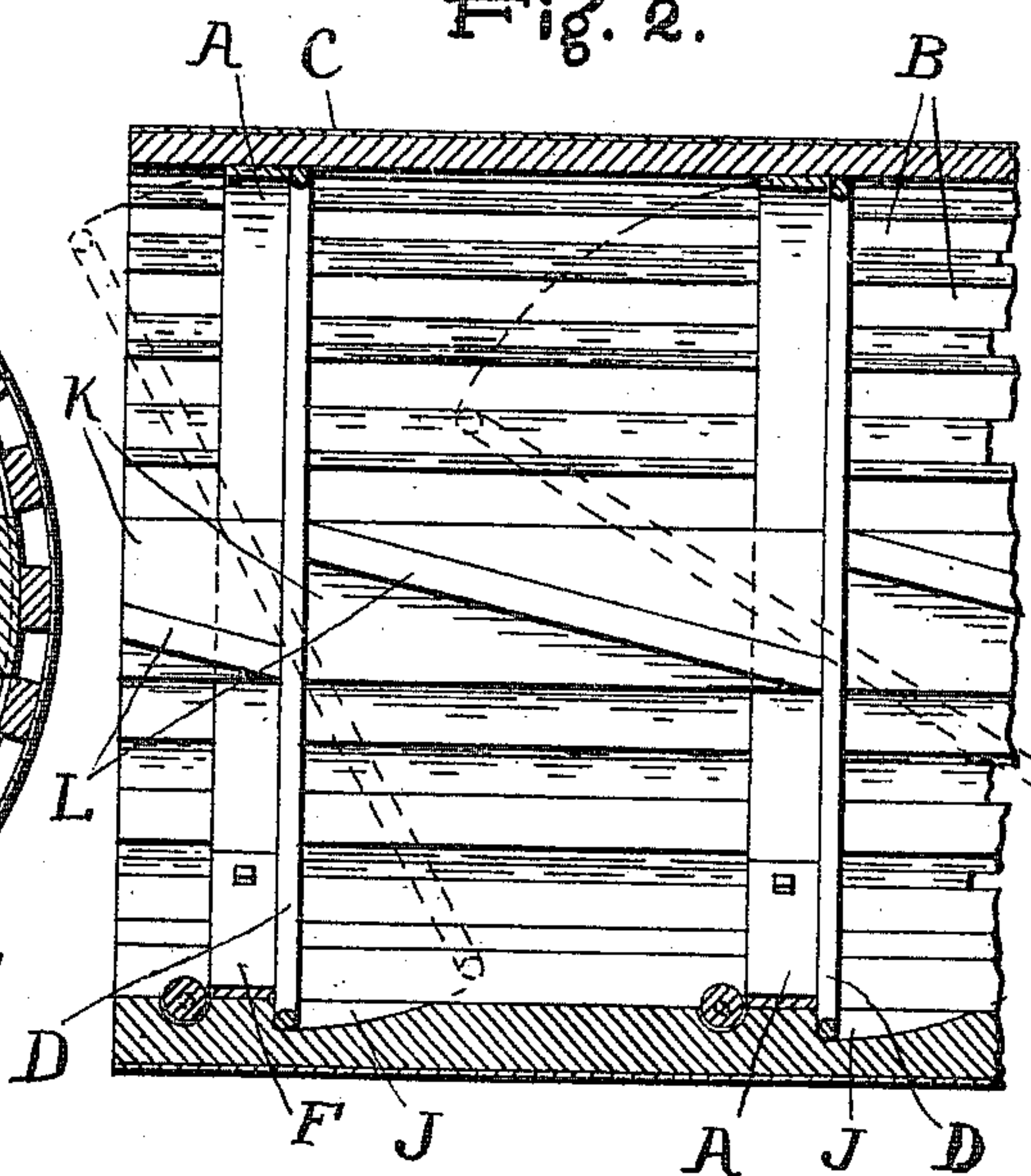


Fig. 4.

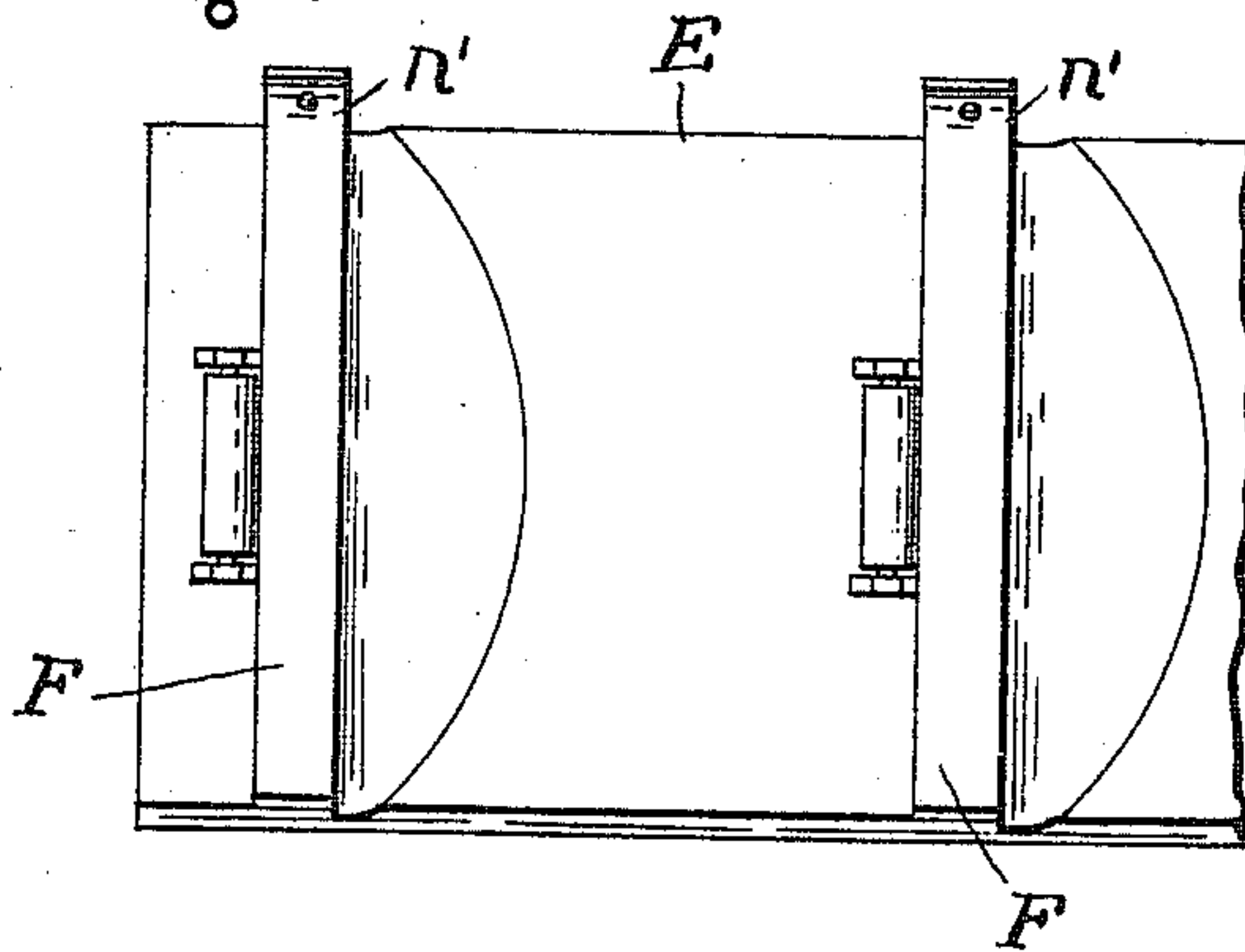


Fig. 3.

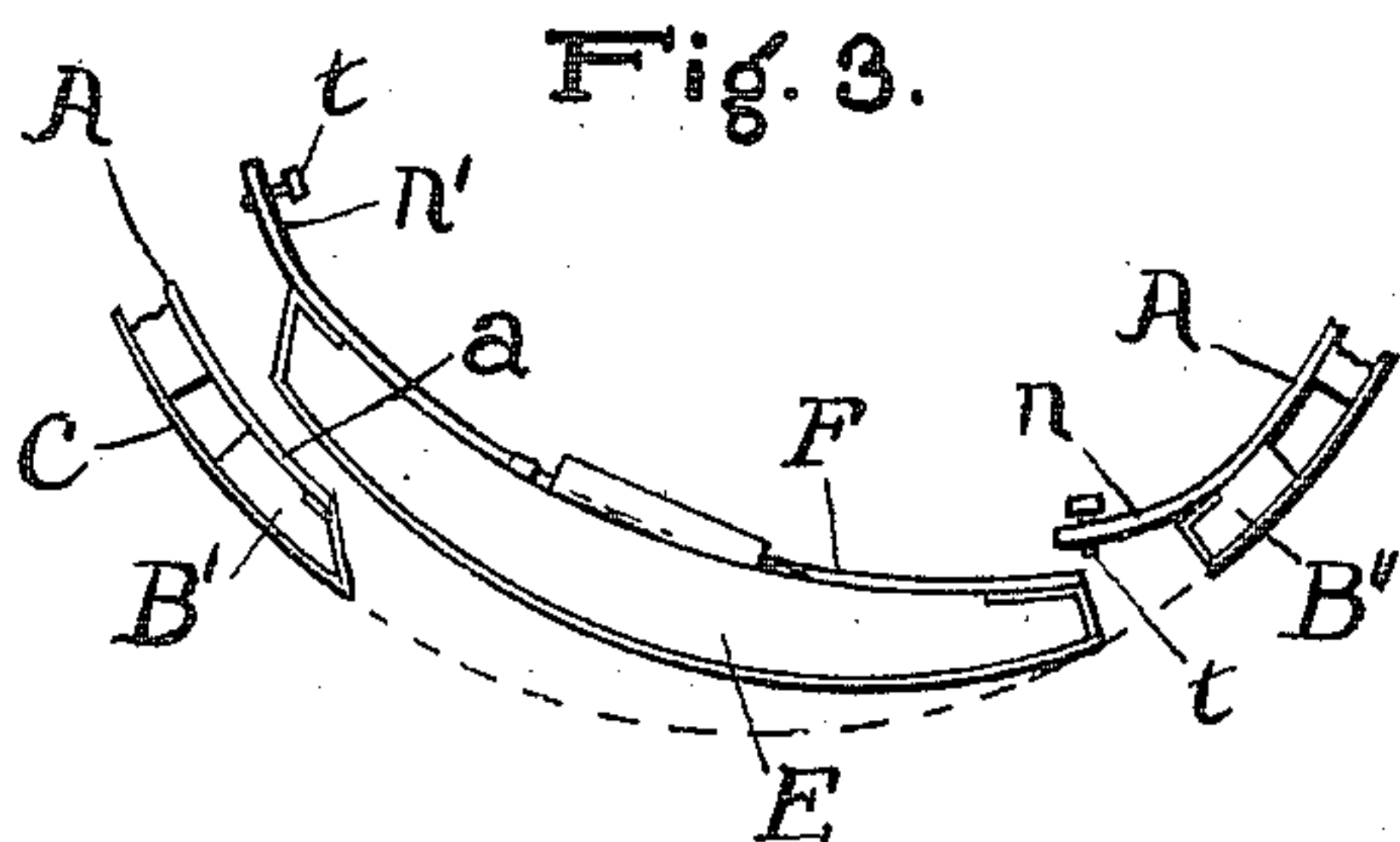
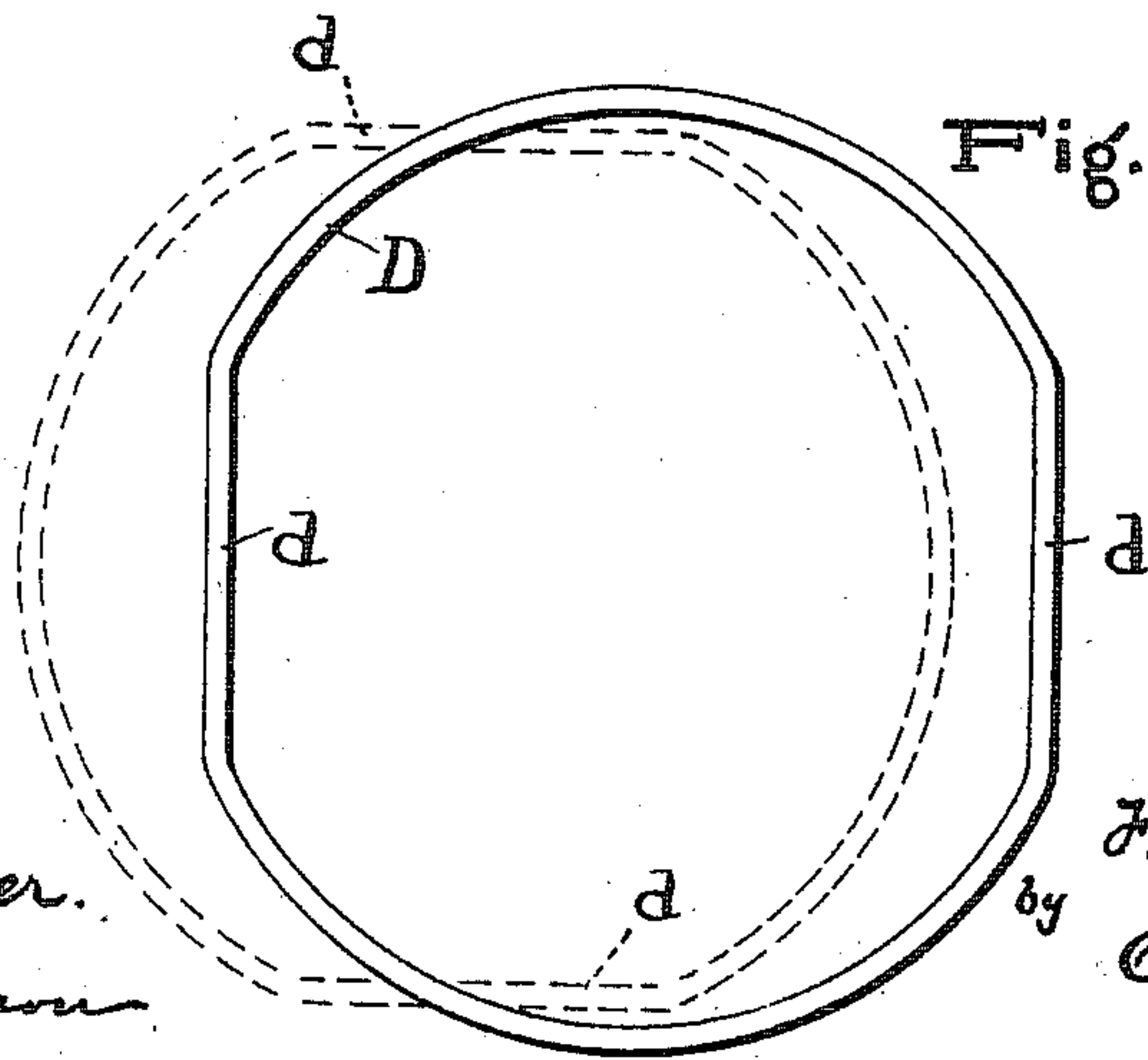


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANCIS SAVIER GRAEF, OF NEW YORK, N. Y.

INTERIOR MOLD OR FORM FOR CONCRETE STRUCTURES.

983,046.

Specification of Letters Patent.

Patented Jan. 31, 1911.

Application filed February 18, 1910. Serial No. 544,674.

To all whom it may concern:

Be it known that I, FRANCIS SAVIER GRAEF, a citizen of the United States, and resident of New York, in the county of New York and State of New York, have made a certain new and useful Invention in Interior Molds or Forms for Concrete Structures; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a transverse sectional view showing the invention. Fig. 2 is a longitudinal sectional view. Fig. 3 is a detail view showing end of spreader. Fig. 4 is a plan view showing end portion of spreader. Fig. 5 is a view of a stiffener ring.

The invention has relation to improvements in cores or interior forms for molding tubular structures of cement concrete, and it consists in the novel construction and combinations of devices as hereinafter set forth.

The object of the invention is to provide an adjustable core or inner mold form of tubular form and substantial strength, which is normally contracted in diameter in such wise that when in normal or contracted condition it can be removed with facility through that portion of the structure which is finished, or through other sections of similar mold-forms while in expanded position.

In the accompanying drawings, illustrating the invention, the letter A, designates a longitudinal series of transverse circumferential elastic metal ribs having a shape or contour like that which the core or mold-form is designed to bear. This contour is shown as circular in the drawings, but it may be elliptical or polygonal. The rib is normally of smaller diameter than when in expanded shape, the latter being its proper size when set up. To these ribs A, are secured the longitudinal strips B, which are designed to be made of wood and serve with the ribs to form the skeleton core. These strips are placed in circumferential series around the ribs on the outside thereof, and are secured thereto, each rib being separated from the next by an interval e . The ribs are incomplete circles or polygons, having each an end a , to which is secured an edge-

strip B', and a bearing end n , which extends beyond the other edge-strip B'', which is also secured thereto.

E, designates a longitudinal spreader board having the proper contour to complete the form or core when the skeleton or elastic portion is expanded, and the spreader is introduced between the edge strips B', and B''. The spreader is provided with ribs F, in series, corresponding to the elastic ribs A, of the skeleton, and these ribs F, have each a rigid bearing end n' , which extends from the edge of the spreader-board, so as to engage the end a , of the skeleton rib A, the other end of the spreader rib being engaged by the rigid bearing end n , of the rib A. The edges of the spreader-board are designed to abut against the edges of the edge strips B', and B'', of the skeleton-form, and its edges are usually chamfered or beveled so that it is wider on its inside than on its outside surface, so that when the bolts or other fastenings t , t , are loosened the spreader-board can be removed inward and through the interior of the mold.

C, represents the sheet-metal covering on the outside of the strips B.

D, represents stiffening rings made of rod or bar-metal, of sufficient thickness to insure rigidity of shape, provided to be introduced within the core to brace it against the weight of the concrete structure. These stiffening rings are designed to be introduced into the core-mold when set up, and are forced against the ribs A, and into recessed bearings J, of the spreader. Each stiffener ring is made with opposite parallel flat or straight sides d , whereby it is of smaller diameter through these sides than through its contour portion. In this way it is provided that each ring can be turned so as to be passed through the interior of the mold as well as through any other ring, and when introduced in position adjacent to a rib A, can be turned to engage the rib and the spreader bearing and in this way secured in place. In order to brace the core at the opposite flat portions of the stiffening rings where they do not bear against the strips or ribs, the longitudinal guide-boards or strips k , are provided at the sides of the skeleton-core. These guide-boards are provided with oblique interior bearing bars L, which are made sufficiently short to allow a small distance between the ends in the circumferen-

tial direction, whereby these ends form bearings to assist in holding the stiffening rings in position when set up against the ribs A. The inclination of these bearing bars L, also provides for intervals between them in the direction of their inclination, such intervals being sufficient for the passing of the stiffening rings when introduced within and along the interior of the core. The ends of these bars L, also leave a fulcrum whereby the stiffening rings can be turned to circumferential position, when they are secured or substantially locked by their engagement with the different bearings, that is to say the elastic ribs A, the bearing bars L, and the spreader bearings J. These core-forms may be provided in lengths and set up in series endwise to facilitate the construction of a tubular conduit, of any length, as the forms may be used several times in the same structure because of the facility with which the collapsed forms may be moved along the interior of the expanded forms. After the forms are set up and braced, the concrete is overlaid thereon to form the conduit or other structure, and when this has hardened the stiffening rings can be taken out through one another and the forms first used can be withdrawn through the other forms and set up again to continue the work. The spreader-board E, is usually provided with transverse rollers along its concave or protected portion to facilitate the movement of an automatically contracted mold-form along the in-

terior of the cores which have been expanded and braced in position. 35

Having described the invention, what I claim and desire to secure by Letters Patent is:

1. In a mold-form for plastic structures, the combination with an automatically contracting tubular elastic shell and a longitudinal spreader member, of means of attachment along the edges of said shell to connect the same together in contracted position and for holding the spreader member in place in expanded position. 40 45

2. In a mold form for concrete structures, the combination with an automatically contracting tubular elastic shell and an inward movable longitudinal spreader, of a series of laterally flattened movable stiffening rings and interior longitudinal brace strips of said shell. 50

3. In a mold for concrete structures, the combination with an automatically contracting expansible tubular shell and an inward movable longitudinal spreader, of series of attachment devices along the edges of said spreader, laterally flattened movable stiffening rings, and means for bracing the same within said shell. 55 60

In testimony whereof I affix my signature, in presence of two witnesses.

FRANCIS SAVIER GRAEF.

Witnesses:

ADA GASCOYNE GRAEF,
ELIZABETH A. GRAEF.