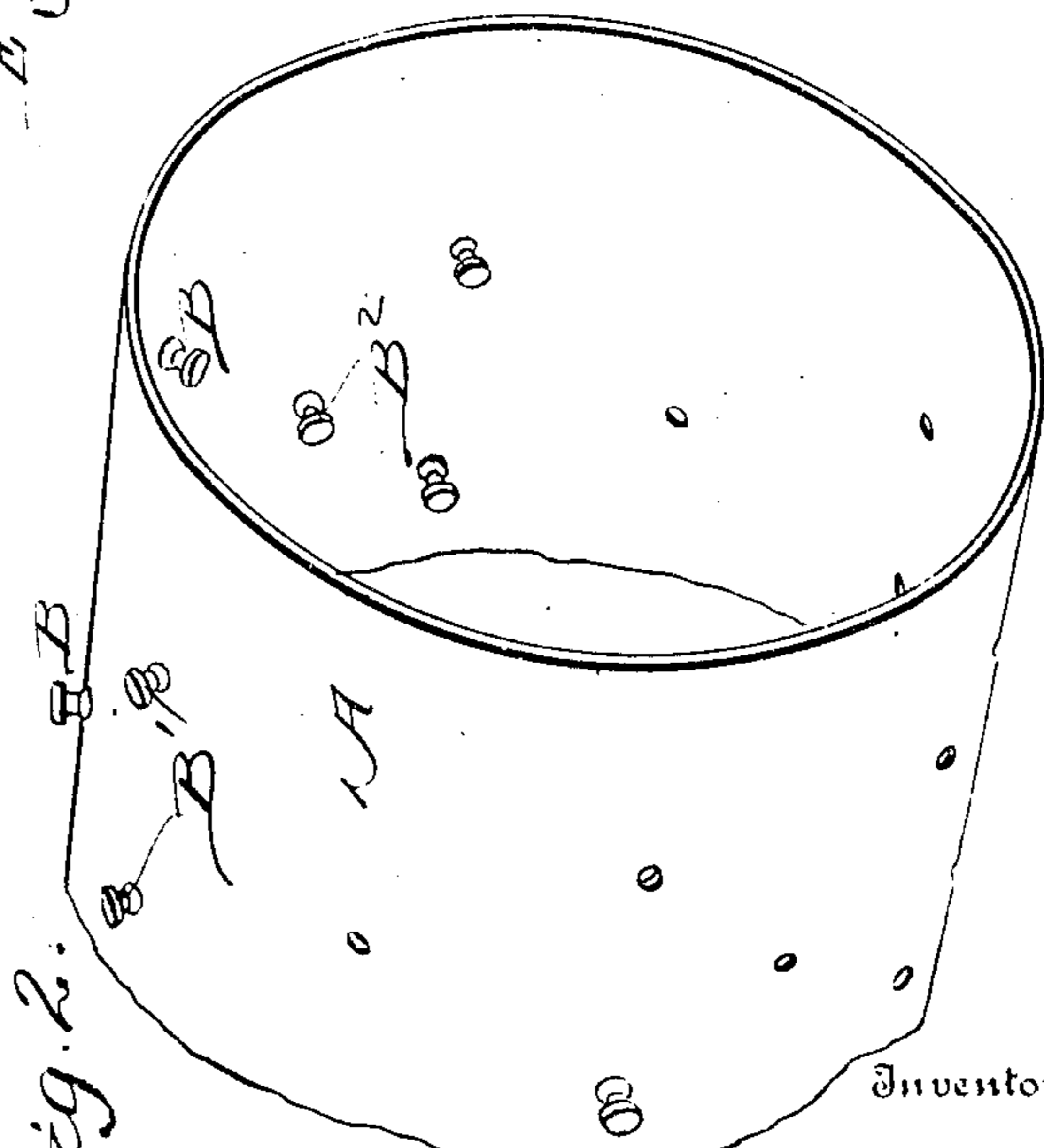
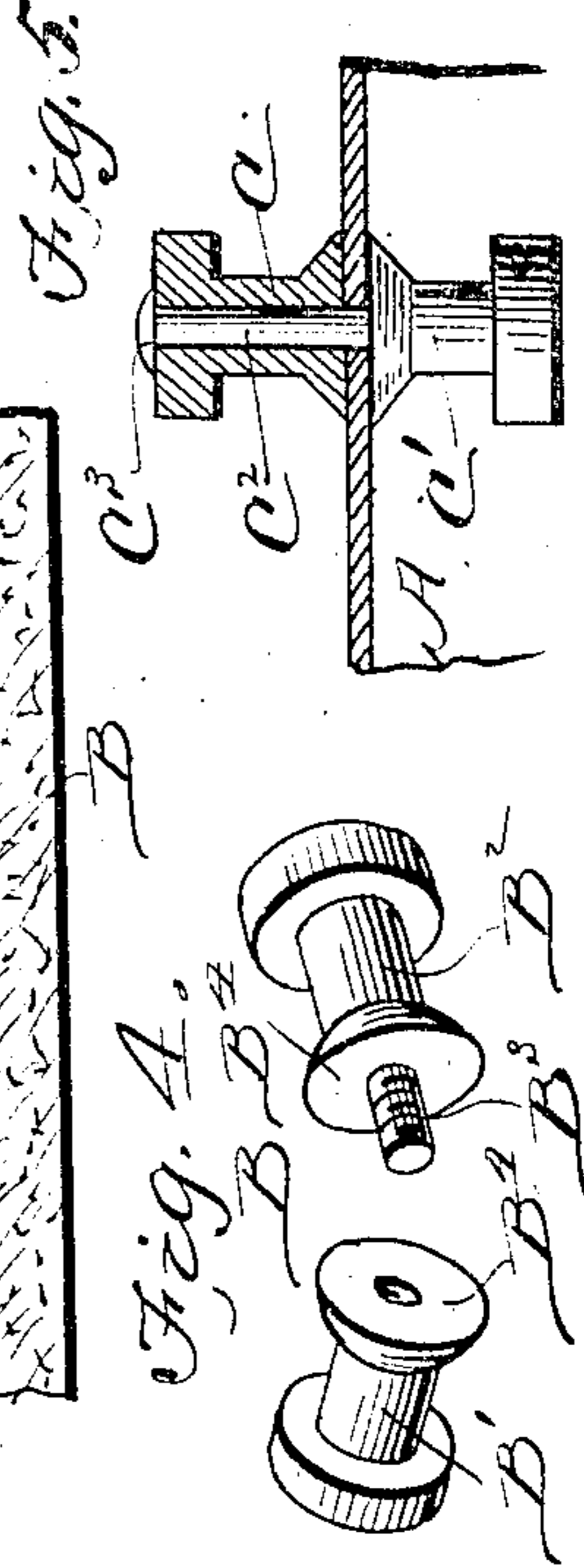
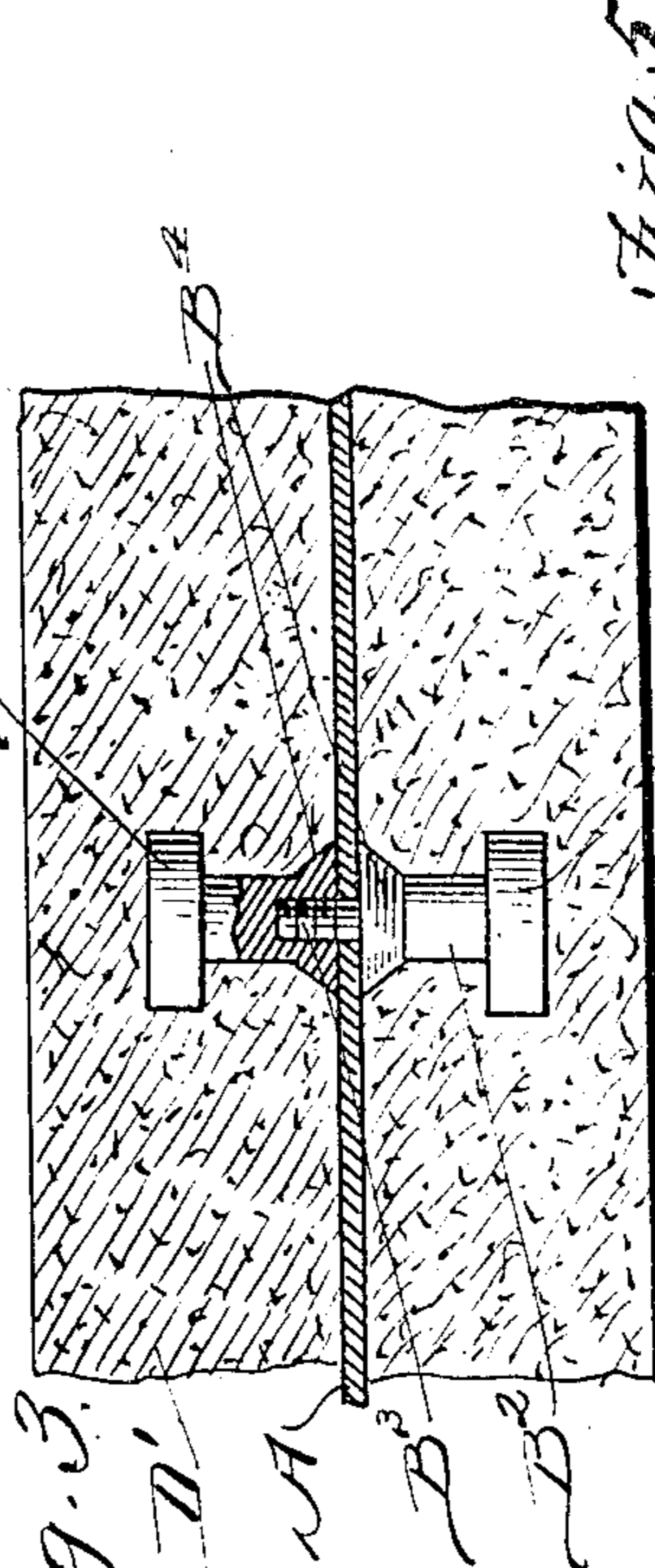
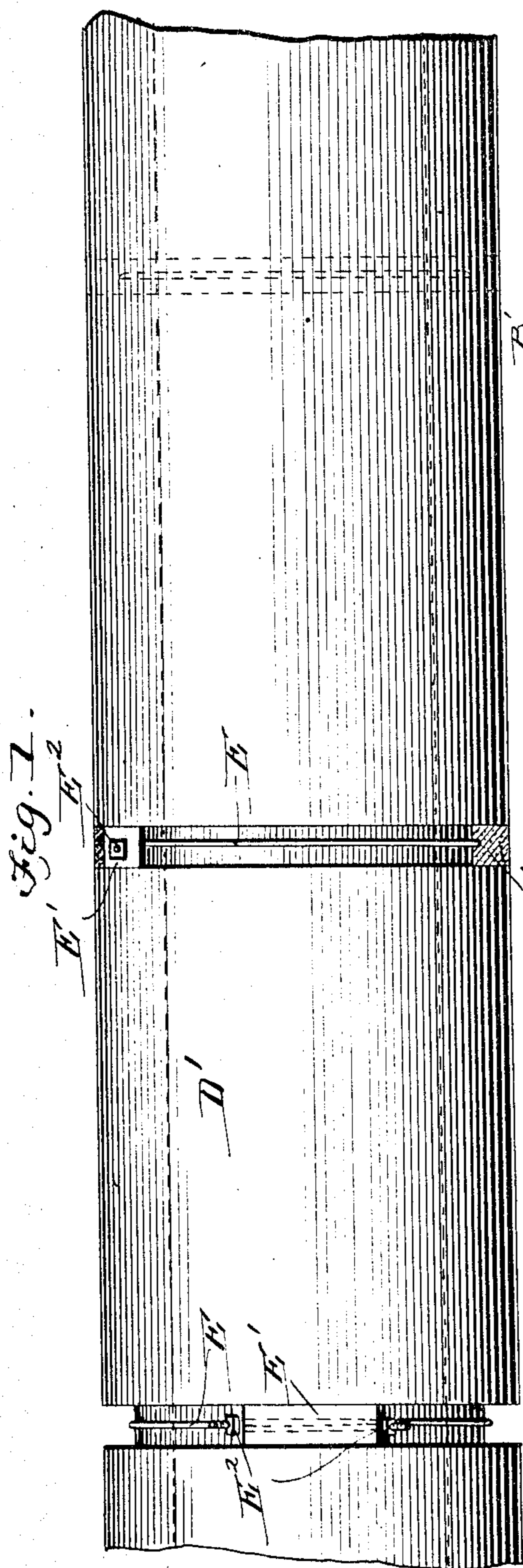


J. M. PHELAN.
 REINFORCED CONCRETE WATER PIPE OR CONDUIT.
 APPLICATION FILED JULY 23, 1906.

912,885.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.



Witnesses
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 E. B. McBeth

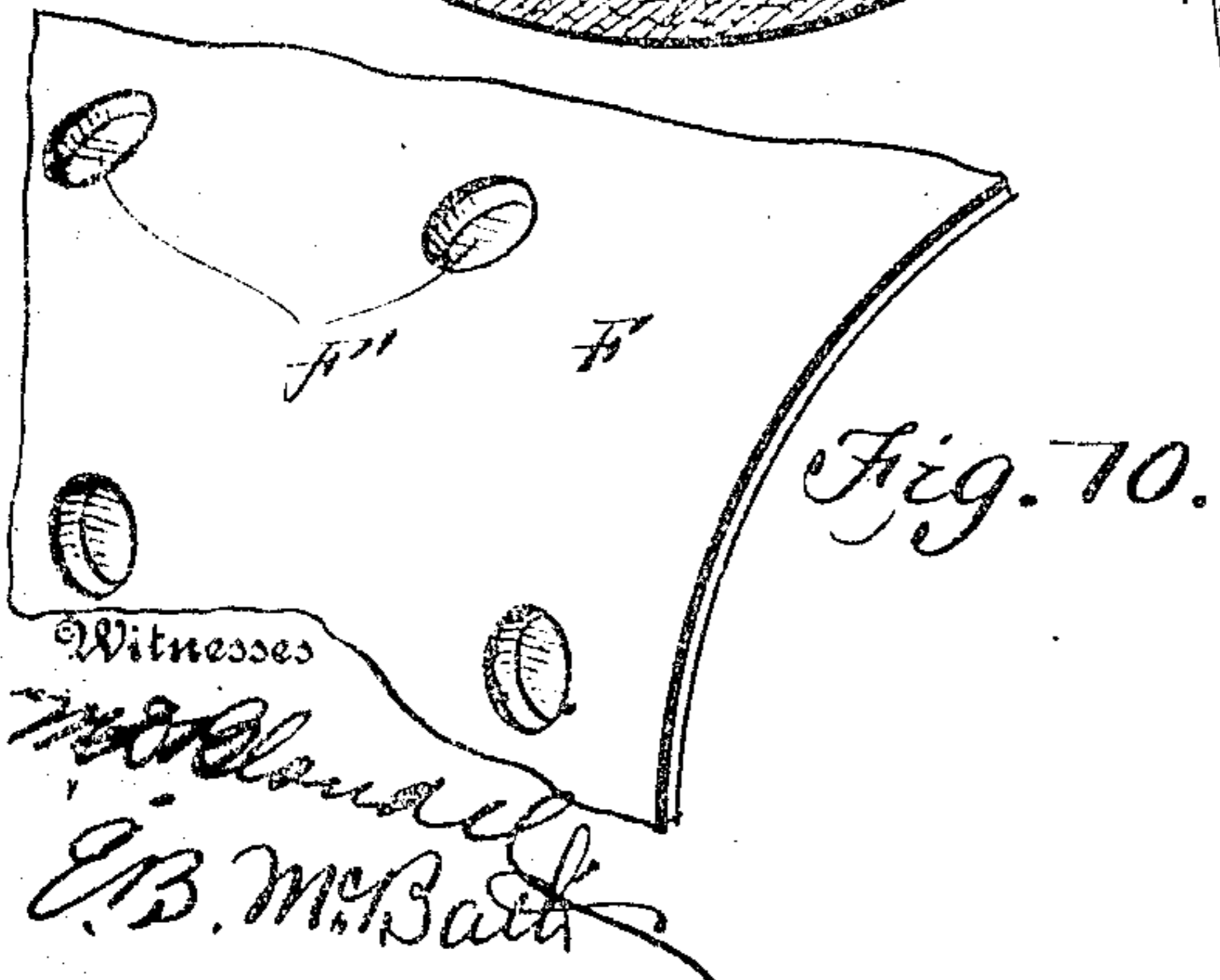
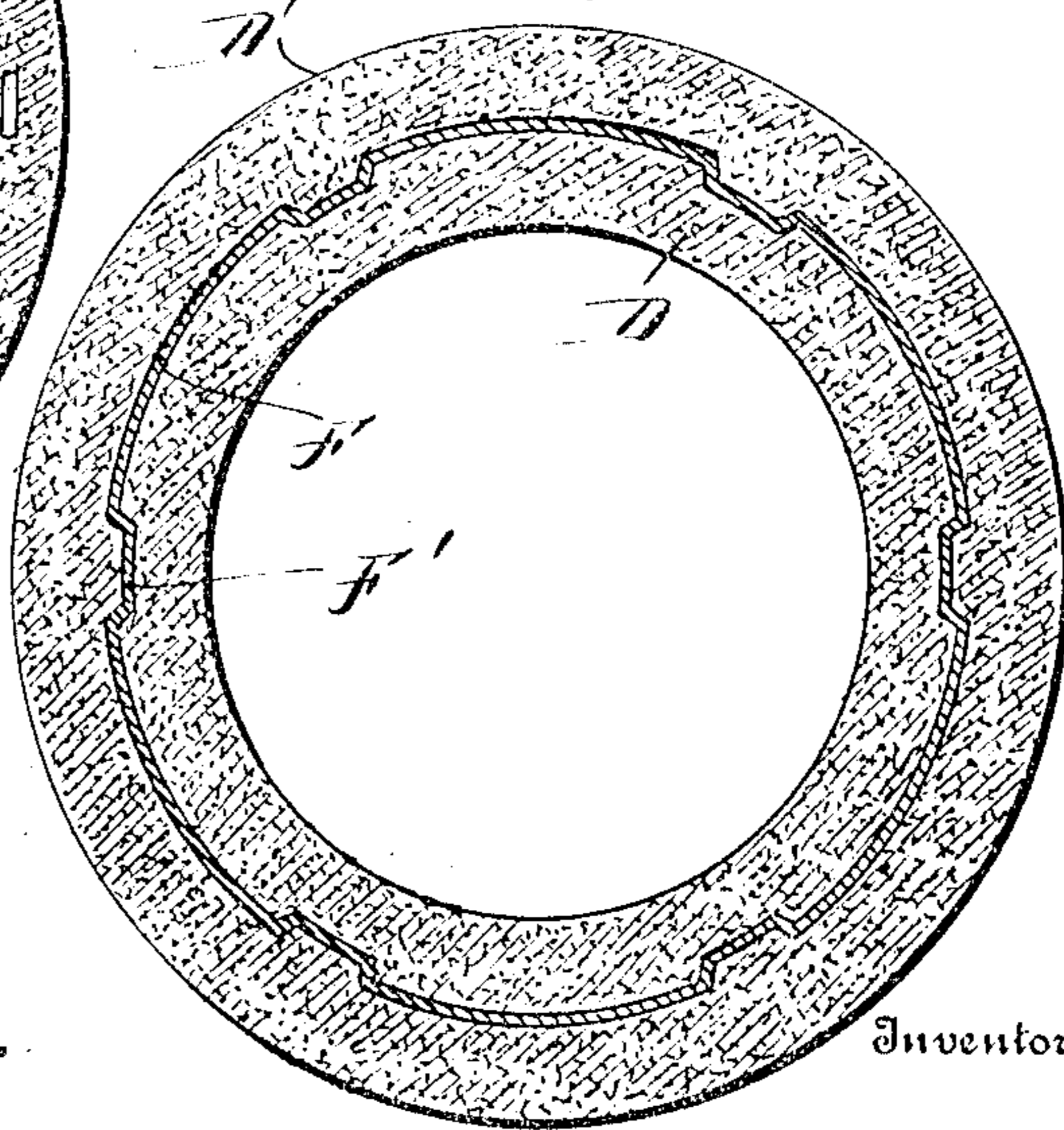
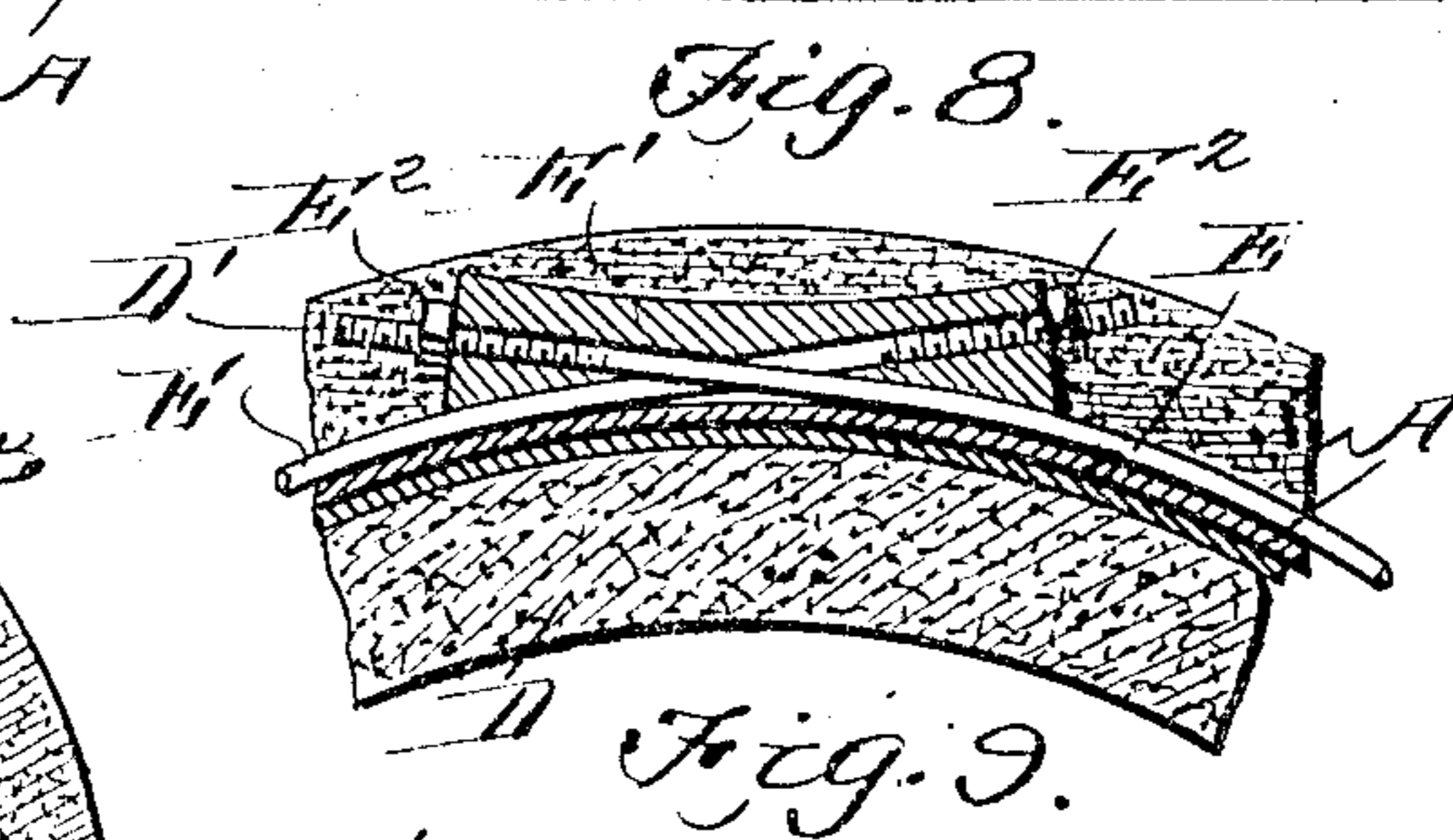
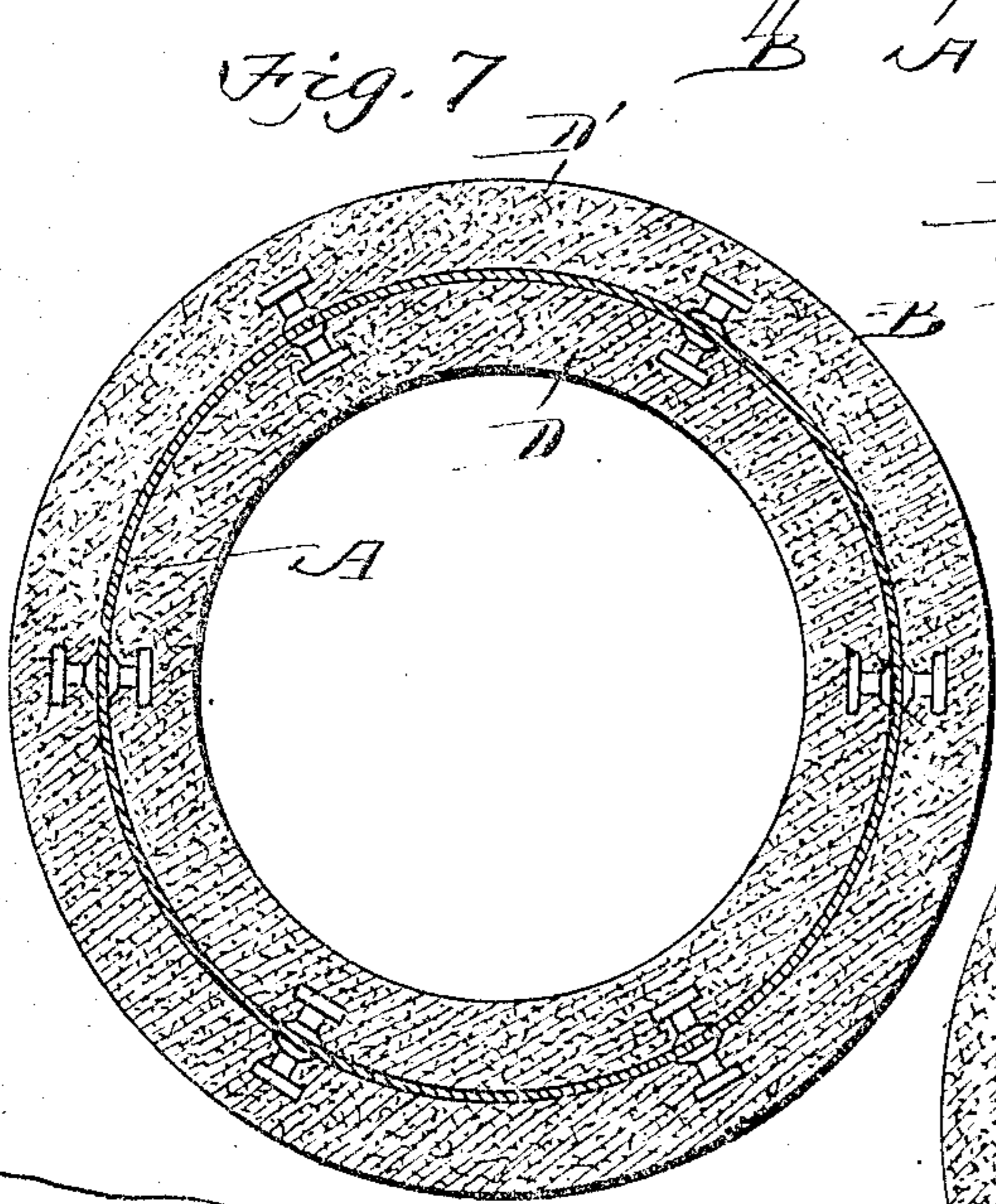
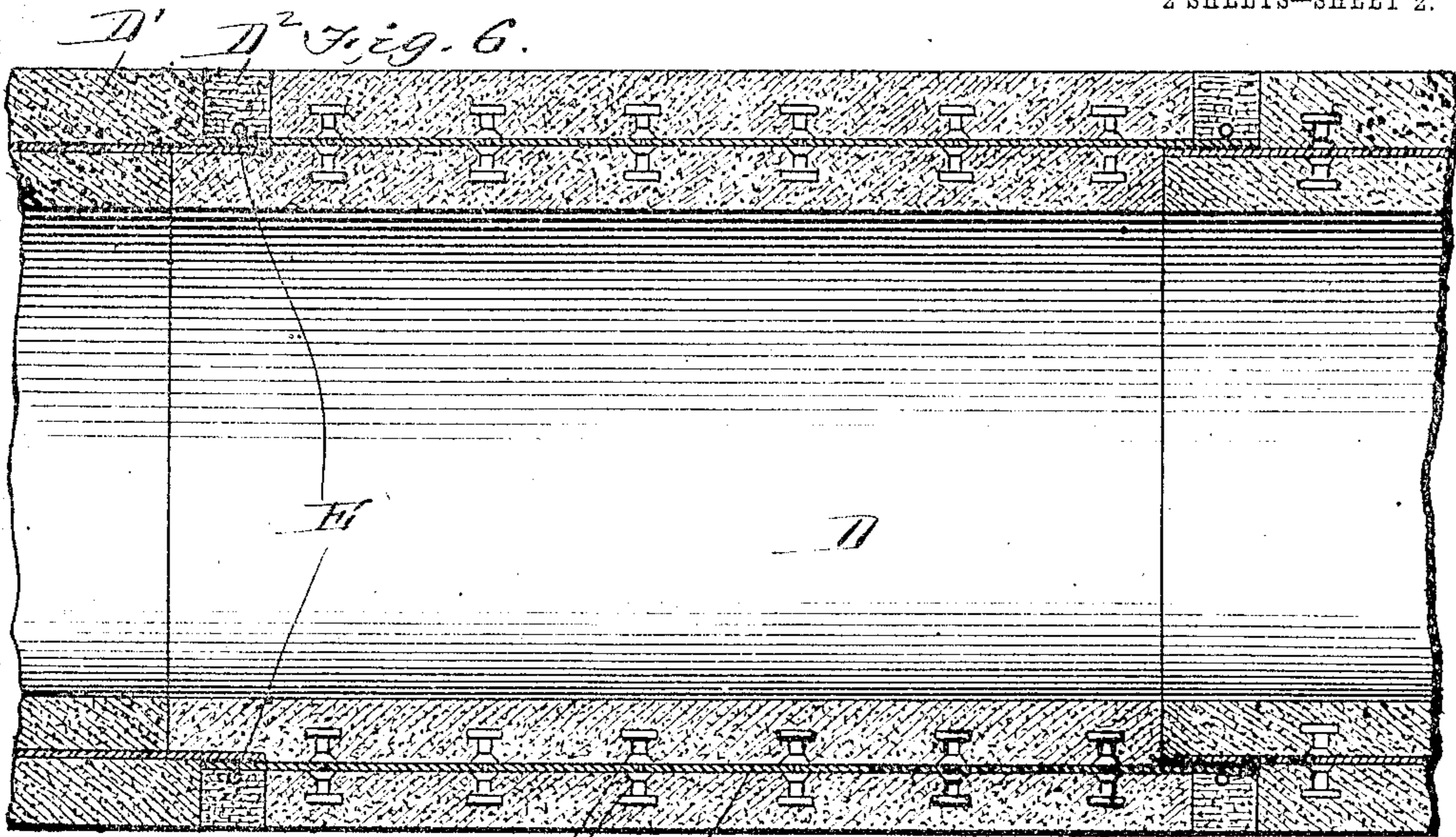
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN M. PHELAN, OF JACKSON, MICHIGAN, ASSIGNOR TO THE REINFORCED CONCRETE PIPE CO., OF JACKSON, MICHIGAN, A CORPORATION OF OHIO.

REINFORCED-CONCRETE WATER PIPE OR CONDUIT.

No. 912,885.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed July 23, 1906. Serial No. 327,357.

To all whom it may concern:

Be it known that I, JOHN M. PHELAN, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented a new and useful Improvement in Reinforced-Concrete Water Pipes or Conduits, of which the following is a specification.

This invention relates to a concrete pipe designed more especially for use as a conduit for water under a considerable pressure, and the object of the invention is to construct such a pipe of unusual strength.

The invention consists in taking a plurality of tubes of steel, galvanized iron or other suitable material, which tubes are adapted to telescope at their ends, and providing the said tubes with inner and outer layers of concrete or other form of artificial stone, and also in providing means which will prevent movement of the pipe covering, that is of the concrete, upon the pipe.

In the drawings forming a part of this specification:—Figure 1 is a side elevation of a pipe constructed in accordance with my invention and completed with the exception of filling grooves at the point of juncture of the tubes. Fig. 2 is a perspective view of an end portion of one of said tubes with certain ties in place. Fig. 3 is a section taken transversely through a wall of one of my pipes showing one of the ties partly in elevation, and partly in section. Fig. 4 is a detail perspective view of one of the ties, the two parts of the tie being shown detached. Fig. 5 is a section through a wall of one of the tubes showing a modification of the ties, one tie being shown with one part in elevation and the other part in section. Fig. 6 is a longitudinal section through a completed pipe. Fig. 7 is a transverse section through a pipe. Fig. 8 is a section through a portion of a pipe taken adjacent the ends of two telescoping tubes. Fig. 9 is a transverse section through a pipe showing a slight modification in the construction of the tube. Fig. 10 is a detail view of a portion of one of the tubes shown in Fig. 9.

In these drawings A represents a tube which is preferably of steel or galvanized iron but which may be of any suitable water proof material and this tube is provided with a plurality of openings which are drilled in it and through which passes suitable ties B, employed for the purpose of

binding the concrete securely to the tube and preventing the concrete slipping in any direction upon either the outer or inner surfaces of the tube. These ties as shown in Fig. 4, are preferably formed of a shank B' provided with a threaded socket and of a shank B² provided with a threaded portion B³ which engages the socket of the shank B'. Both shanks are expanded as shown at B⁴ to provide bearing surfaces to rest upon the inner and outer faces of the tube A, respectively, and both the shank B' and the shank B² are provided with suitable heads.

In Fig. 5 I have shown a slightly modified construction which avoids the use of the threaded portion B³. In the construction shown in Fig. 5 the tie is formed of a sleeve C and a shank C' which is provided with a pin C² which passes entirely through the sleeve C and is expanded or riveted as shown at C³ at its upper end. Otherwise, the construction is the same and the only practical difference is that one form of tie has its separate parts connected by screwing them together while the other form of tie has the two parts riveted together.

Upon the inner face of each tube A is placed a layer of concrete D, which surrounds and entirely embeds the inner portions of the ties B. The concrete D extends flush with one end of the tube A so that when the tubes are joined the concrete D extends continuously through the pipe. Upon the outer face of each tube is placed a layer of concrete D' which also embeds the outer portions of the ties B but which terminates short of each end of the tube. It will be obvious therefore that when the tubes with the concrete applied thereto, are joined together by telescoping their end portions a plurality of circumferential grooves will be left upon the outer face of the pipe. In each of these grooves is fitted a ring which consists of a wire rod E threaded adjacent each end and a washer E' is formed of a block which fits within the grooves and which is provided with oppositely arranged passages and through these passages the end portions of the wire E are passed, said portions overlapping each other. Nuts E² are threaded upon the projecting end portions of the wire E whereby it is drawn over tightly about the tubes A and firmly bind their telescoping end portions together. The groove is then filled with concrete as shown

at D² covering the wire E, washer E' and nuts E². The completed pipe therefore affords both inside and outside a smooth surface of concrete or artificial stone.

In Figs. 9 and 10 I have shown a slight modification in which I employ a tube F provided with a plurality of depressions, which depressed portions project inwardly taking the place of the holes drilled in the pipe A and of the ties B. The inner layer of concrete has the depressed portions F' sunken into it, while the outer layer D' enters and fills the depressions themselves. These depressed portions therefore, form ties integral with the tube.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a pipe of the kind described a tube, a

plurality of inwardly and outwardly extending sectional telescoping ties carried by said tube, and inner and outer layers of concrete applied to the tubes and covering the said ties.

2. A pipe of the kind described comprising a tube of water proof material having openings formed therein, a tie consisting of a shank having a socket, a shank having a pin adapted to engage said socket, said pin passing through the walls of the tube, and layers of concrete arranged upon the inner and outer face of said tube and covering the said tie.

JOHN M. PHELAN.

Witnesses:

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P. L. HOLLYWOOD.