

(No Model.)

2 Sheets—Sheet 1.

J. P. COSTIGAN.

AIR SPACE COVERING FOR STEAM PIPES, BOILERS, &c.

No. 459,035.

Patented Sept. 8, 1891.

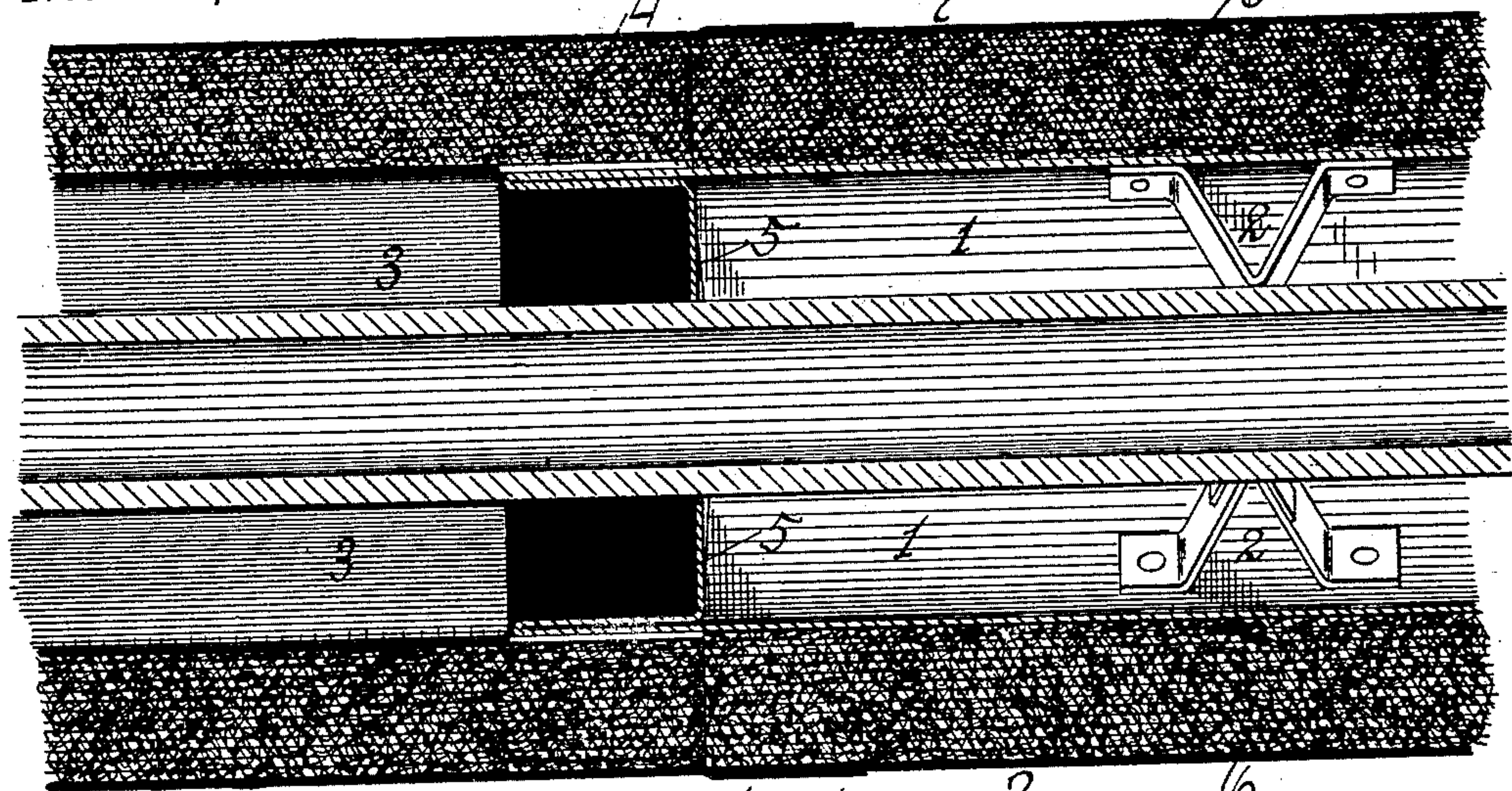


Fig. 1.

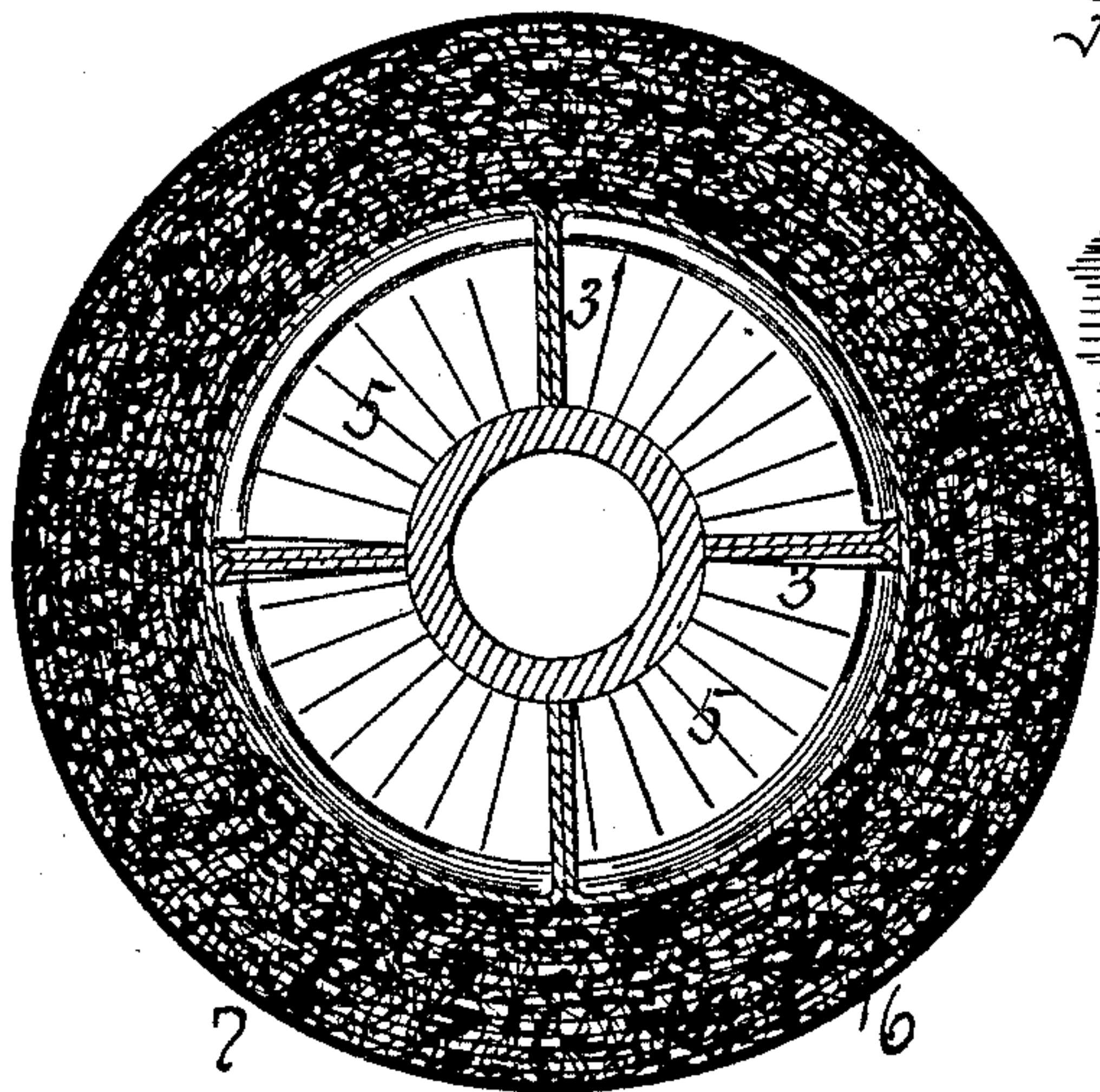


Fig. 2.

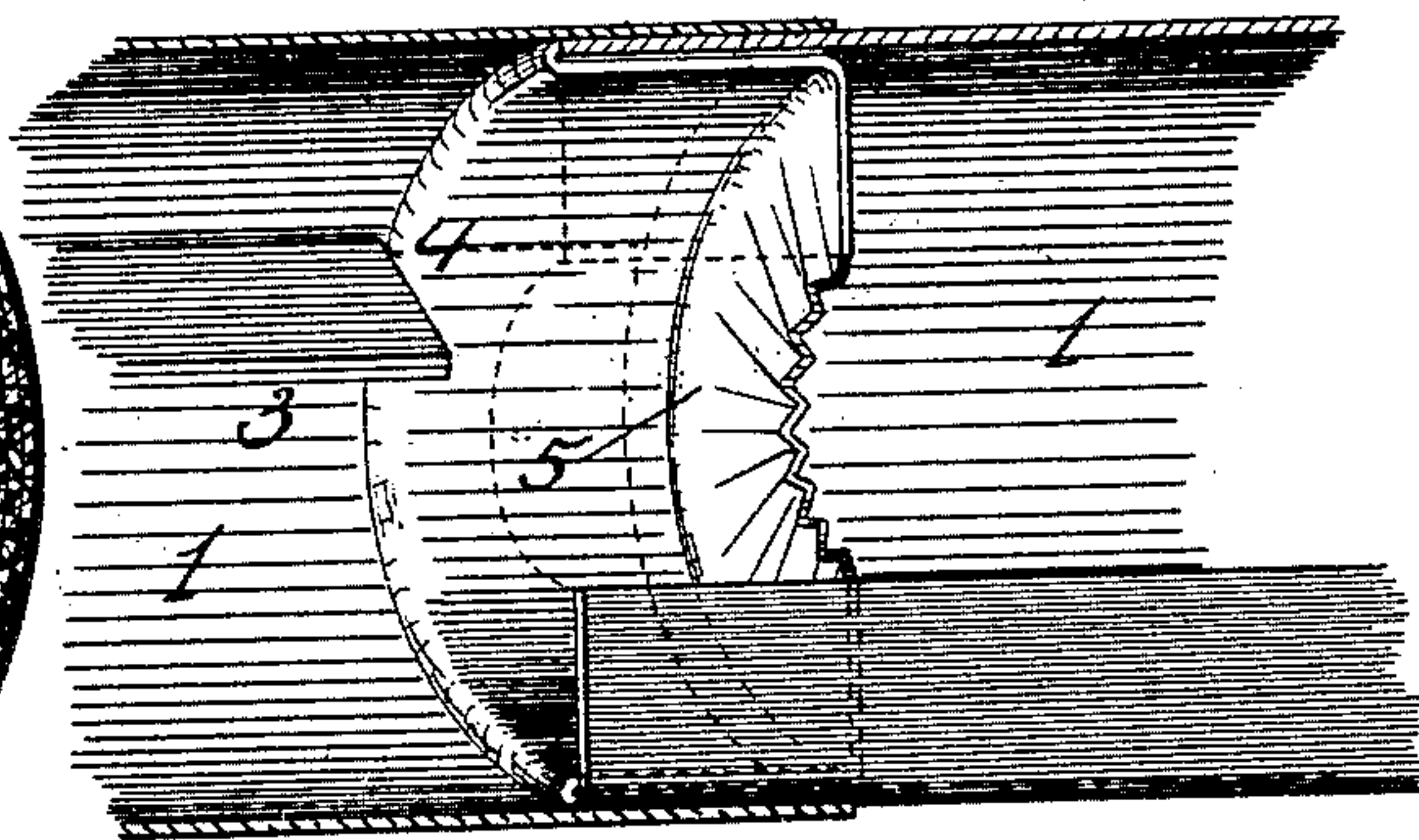


Fig. 3.

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Fig. 4.

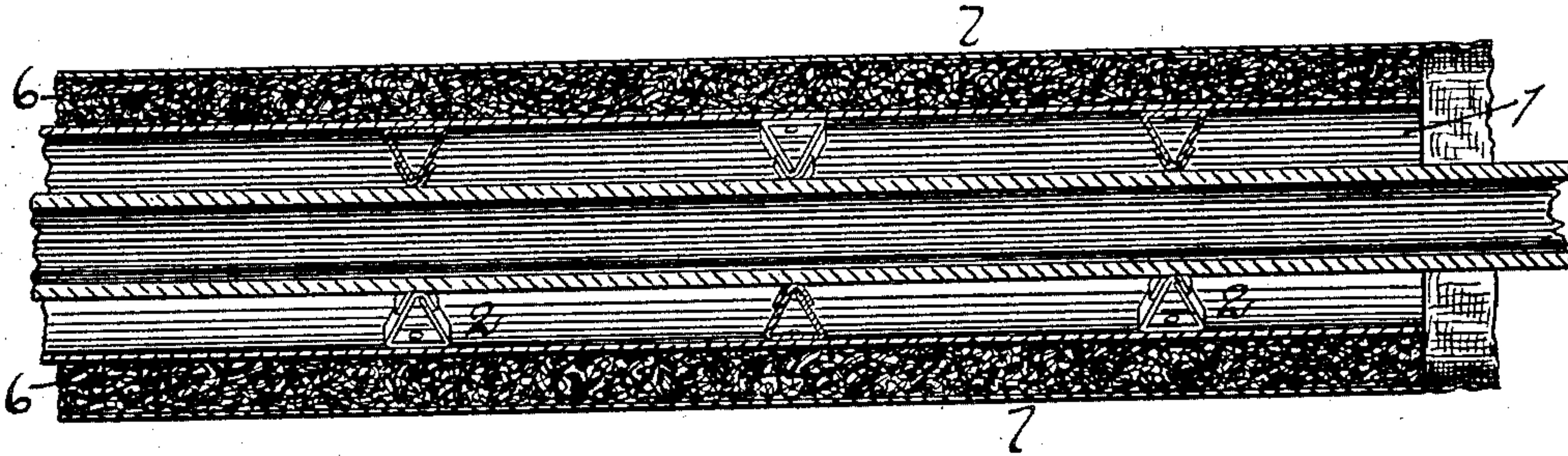


Fig. 5.

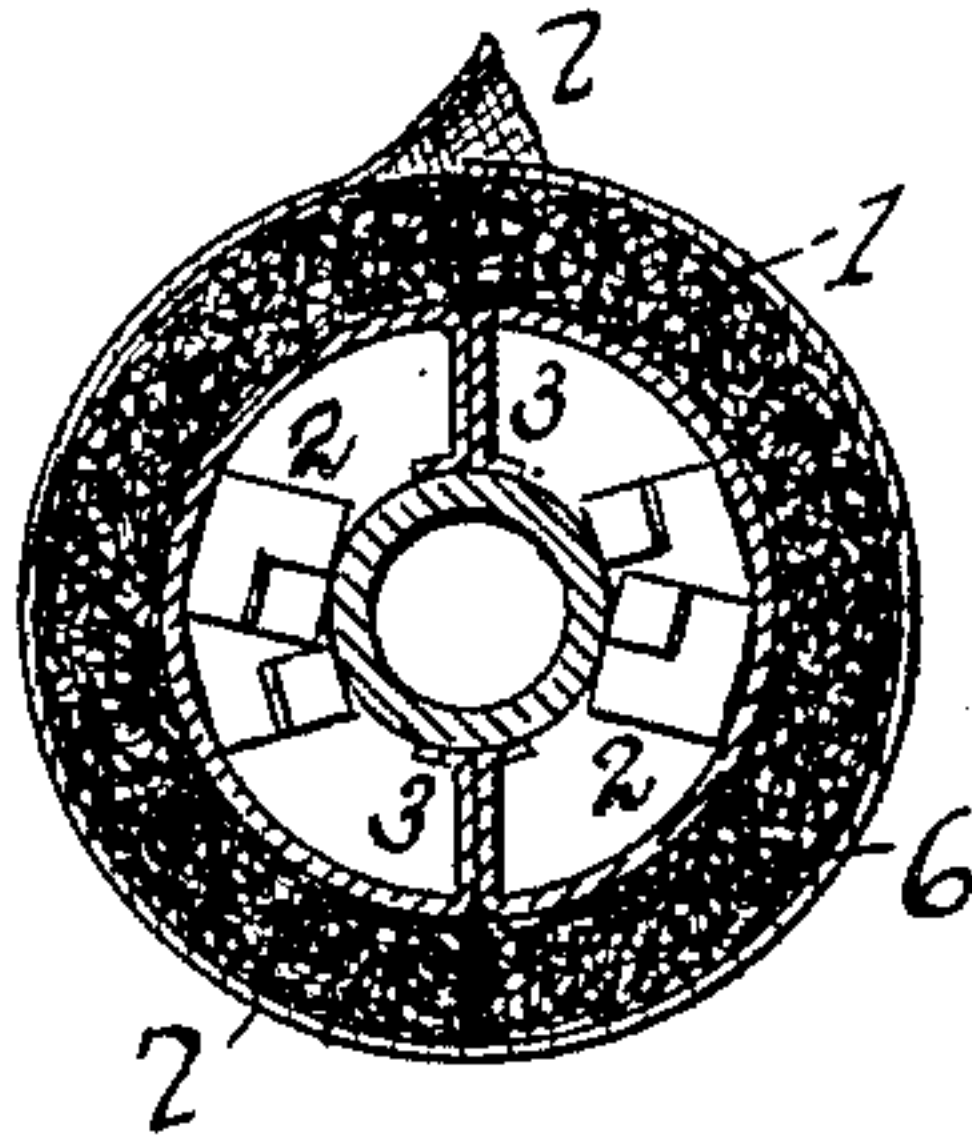


Fig. 6.

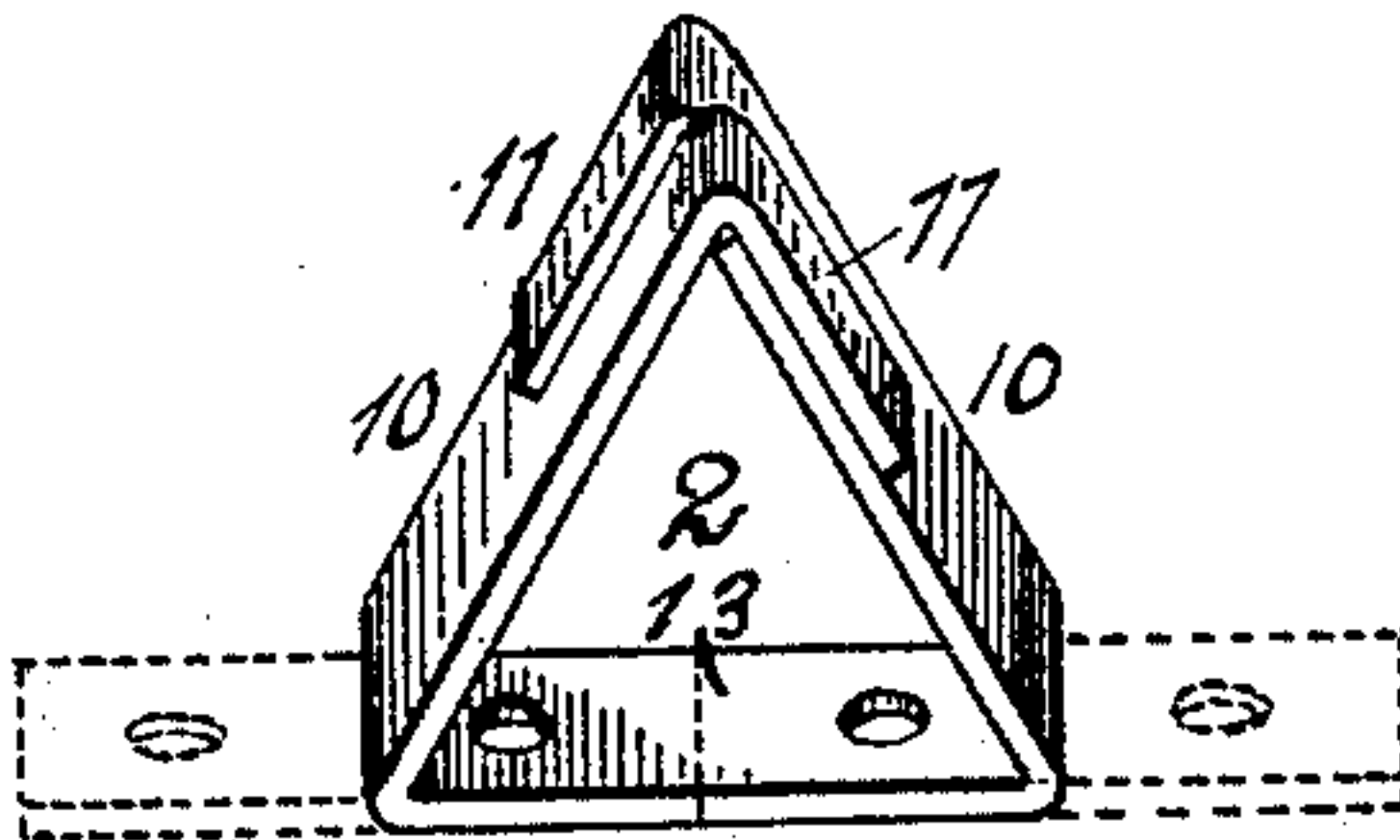
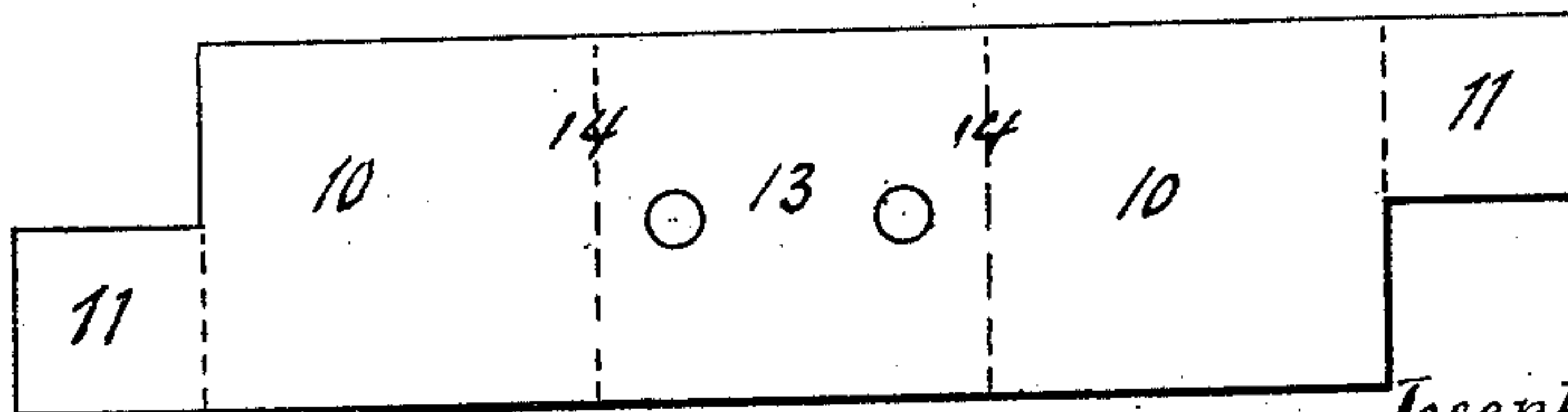


Fig. 7.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOSEPH P. COSTIGAN, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO THOMAS M. VALLEAU, OF BROOKLYN, NEW YORK.

AIR-SPACE COVERING FOR STEAM-PIPES, BOILERS, &c.

SPECIFICATION forming part of Letters Patent No. 459,035, dated September 8, 1891.

Application filed February 24, 1891. Serial No. 382,642. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. COSTIGAN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Air-Space Coverings for Steam-Pipes, Boilers, &c.; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in coverings for steam-pipes, boilers, and the like, and is of that particular class in which the non-radiating quality desired to be secured is effected by the assistance of an air-space included within said covering and immediately surrounding the heated surface.

The object of the invention is to furnish a covering which may be manufactured at a small expense, which may be easily and securely put in place and which shall possess the requisites of great durability and small conductivity or radiating qualities.

The invention consists in the novel means employed for enabling the sealing of the air-spaces inclosed by individual sections of the covering and in the form of the supports or struts for separating the covering from the surface to be covered, and is in the nature of an improvement upon the invention set forth in application Serial No. 370,471, by Costigan and Valleau, filed November 6, 1890.

In the drawings, Figure 1 is a longitudinal section of my improved covering; Fig. 2, a cross-section of the same; Fig. 3, a sectional perspective view of the connecting ends of adjacent sections; Fig. 4, a longitudinal section showing the arrangement of the supports and different forms of the same; Fig. 5, a cross-section of the covering; Fig. 6, a detail view of one of the supports, and Fig. 7 a view of the blank from which the support shown in Fig. 6 is formed.

The covering consists of an inner sheet-metal plate or shell 1, having secured thereto or formed thereupon a series of supports or struts 2 2, by means of which the shell is sup-

ported upon and separated from the surface to be covered, leaving an air-space between the two as a non-conducting medium. The shell is made up in sections of a length convenient for handling, and for cylindrical surfaces, as for pipes, each section is made of two semi-cylindrical parts adapted when united to inclose a certain length of pipe, say about three feet. The edges of each section are turned in, as at 3, and form feet adapted to rest upon the pipe or other surface in the same manner as shown in the previous application. Adjacent sections are united by overlapping one upon the other for a short distance, the inwardly-projecting lip 3 being cut away, as shown at 4, for a distance equal to the overlap, the shoulder thus formed abutting against the extremity of the entering section. The air-spaces inclosed by the adjacent sections are separated by means of a body of cement or other non-conducting sealing material closing the end of the entering section around the pipe, and for convenience in effecting such sealing a novel construction of the pipe is employed. One end of each section is in the course of its formation bent back upon itself inwardly, as shown in Fig. 1, for a short distance, and the edges of this turned-in part bent up to lie in a plane perpendicular to the length of the section, this latter bent-up portion 5 thus forming an inwardly-projecting shelf of annular form around the interior of the cylinder at a short distance from one extremity. The length of metal turned up or the depth of the shelf 5 is preferably equal to or a little less than the depth of the air-space or the distance between the shell and the surface to be covered. The length of space thus cut off and separated from the body of the section may vary to any extent, but generally is regulated by the diameter of the covering. When in position upon the pipe, this smaller chamber is filled with cement of any character calculated to withstand the effects of heat and effectually seals the end of the air-chamber. The end of the next section is slipped over the sealed end until the ends of its side flanges abut against the sides of the covering, and the outer end of the next section is sealed in the same manner.

To form a close joint in the non-conducting

covering 6 surrounding the shell, the latter is cut off flush with the end of the shell upon its overlapping extremity, but only extends at the other end to a point as far from the end as the depth of the overlap, generally equal to the distance of the annular shelf 5 from the end. The whole is inclosed in an outer covering of canvas 7 or similar material, which overlaps the joint formed by the abutting ends of the covering 6, and is either sewed, cemented, or otherwise secured tightly in place. The inwardly-turned annular shelf 5 may be either slit in several places, as shown in Fig. 2, or the inner edge may be crimped, as in Fig. 3, to take up the surplusage of metal on the inner edge occasioned by the difference in length between the outer and inner circumference. The partition may be pressed out at the same time with the shaping of the section, and may be slit, crimped, creased, or corrugated, as above described. The cement not only serves to separate the spaces inclosed by the several sections, but when hardened forms a firm support for the entire covering at the meeting-points of the several sections, while the part turned in to form the cement-space materially adds to the stiffness of the shell at those points. In some cases, as with pipes of small diameter, these cement supports, in addition to the side edge supports previously mentioned, may be found sufficient, especially if care is taken in putting on to have the edge supports of adjacent sections come in diametrically-opposite positions; but in some cases it may be necessary to use intermediate supports 2, the construction of some forms of which will now be described. These supports or struts are of triangular or V shape in cross-section, and may be constructed in a variety of ways. The simplest form consists of a single strip of metal bent in V form and having its extremities bent outwardly or inwardly to form feet through which rivets are passed to attach the same to the shell, or the strut may be made in a single piece, having its middle riveted to the shell and its ends bent up and interlocked, in the manner now to be described.

Each side 10 of the support has at its extremity an outwardly-extending finger 11, of substantially half the width of the piece forming the support, the fingers upon the two sides being alternately disposed—that is, the finger upon one side corresponding in position and width with the space beside the finger upon the opposite side. The entire support may be formed in a single piece, the base 13 connecting the two sides and furnishing a means for attaching to the interior of the shell. In this construction the blank is of the form shown in Fig. 7, consisting of an oblong strip of metal having the two fingers or extensions upon each extremity adjacent to opposite edges of the blank, each finger being preferably of one-half the width of the whole blank, one finger corresponding in po-

sition with the space at the side of the other. The opposite ends are then bent inwardly upon the lines 14 until their outer ends meet and the fingers overlap, when the latter are folded over side by side in opposite directions, locking each side to the other, or the two sides may be made of separate pieces with feet bent outwardly, as shown in dotted lines in Fig. 6. In either construction the feet are firmly riveted to the shell by rivets passing through the feet or base.

The meeting edges of the sides forming the strut may be so formed as to interlock in various ways. For instance, one side may be provided with fingers or extensions upon each edge and the edge of the opposite side with a single extension in the middle corresponding with the space between the two fingers upon the opposite edge. The extensions, whatever the number, are alternating in position—that is, the extensions upon one side correspond with spaces between extensions upon the other.

The covering having supports or struts of the form herein described possesses over that shown in the previous patent the advantage that the struts may be made of heavier or lighter material than the body of the shell and their application causes no weakening of the shell. At the same time it may be cheaply and rapidly manufactured, and when once formed is incapable of injury from any ordinary cause.

The construction of the ends of the cement-chambers renders the operation of sealing exceedingly simple and effective, while possessing the other advantages above mentioned.

I claim as my invention—

1. A covering for steam-pipes, boilers, and the like, consisting of a sheet-metal cylinder having formed upon or secured thereto near one extremity thereof within the same an annular partition dividing the space included between said covering and surface to be covered, and a sealing compound filling the space between said partition and the near end of the cylinder.

2. A covering for steam-pipes, boilers, and the like, consisting of a sheet-metal cylinder having near one extremity within the same an annular partition formed upon or secured thereto and dividing the space included between said covering and the surface to be covered, the said cylinder and partition being composed of one or more segmental sections having inwardly-turned flanges upon the adjacent longitudinal edges, substantially as and for the purpose specified.

3. A covering for steam-pipes, boilers, and the like, consisting of a number of sheet-metal cylinders, each having at one extremity an annular space partitioned off within the same by means of a partition formed upon or secured thereto, adapted to be filled with a sealing compound, and the other extremity

telescoped upon the extremity of the adjacent section, substantially as and for the purpose herein specified.

4. A covering for steam-pipes, boilers, and the like, consisting of a number of sheet-metal cylinders, each having near one extremity an annular partition dividing the space inclosed by said cylinder, and a sealing compound contained in the annular space thus formed, internal longitudinal flanges adapted to rest upon the surface to be covered and extending nearly to the unsealed end of the cylinder, the said unsealed end being telescoped upon the sealed end of the adjacent section, so that the ends of said flanges abut against the same, substantially as and for the purpose herein specified.

5. In a covering for steam-pipes, boilers, and the like, composed of a series of sheet-metal cylinders placed end to end, an annular space at one end of each cylinder within the same for containing a sealing or non-conducting compound formed by turning inwardly the end of the metal and bending up the edge of the turned-in portion to lie in a plane at right angles to the direction of the length of the cylinder, substantially as specified.

6. A covering for steam-pipes, boilers, and the like, consisting of a series of sheet-metal cylinders telescoped for a short distance one

upon the other, an annular space formed at the entering end by an inner annular partition near the extremity dividing the space included by the cylinder, a sealing and non-conducting compound filling said annular space and supporting said extremity, and intermediate supports formed upon or secured to the interior of the cylinder and resting upon the surface to be covered.

7. A covering for steam-pipes, boilers, and the like, consisting of an inner plate or shell separated from and supported upon the surface to be covered by means of a series of struts, each consisting of two legs riveted at one extremity to the inner surface of the shell and inclined to meet each other in V shape at their free extremities, and fingers or extensions upon both extremities, the fingers upon one corresponding with the space or spaces beside the finger or fingers upon the other and adapted to fold down each upon the opposite leg, whereby the meeting edges are locked together, substantially as and for the purpose specified.

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

JOSEPH P. COSTIGAN.

Witnesses:

F. W. LANE,
GEO. HUGHES MEAD.