

No. 817,439.

PATENTED APR. 10, 1906.

D. T. McNIEL.

BELT PULLEY.

APPLICATION FILED APR. 1, 1904.

4 SHEETS—SHEET 1.

Fig. 2.

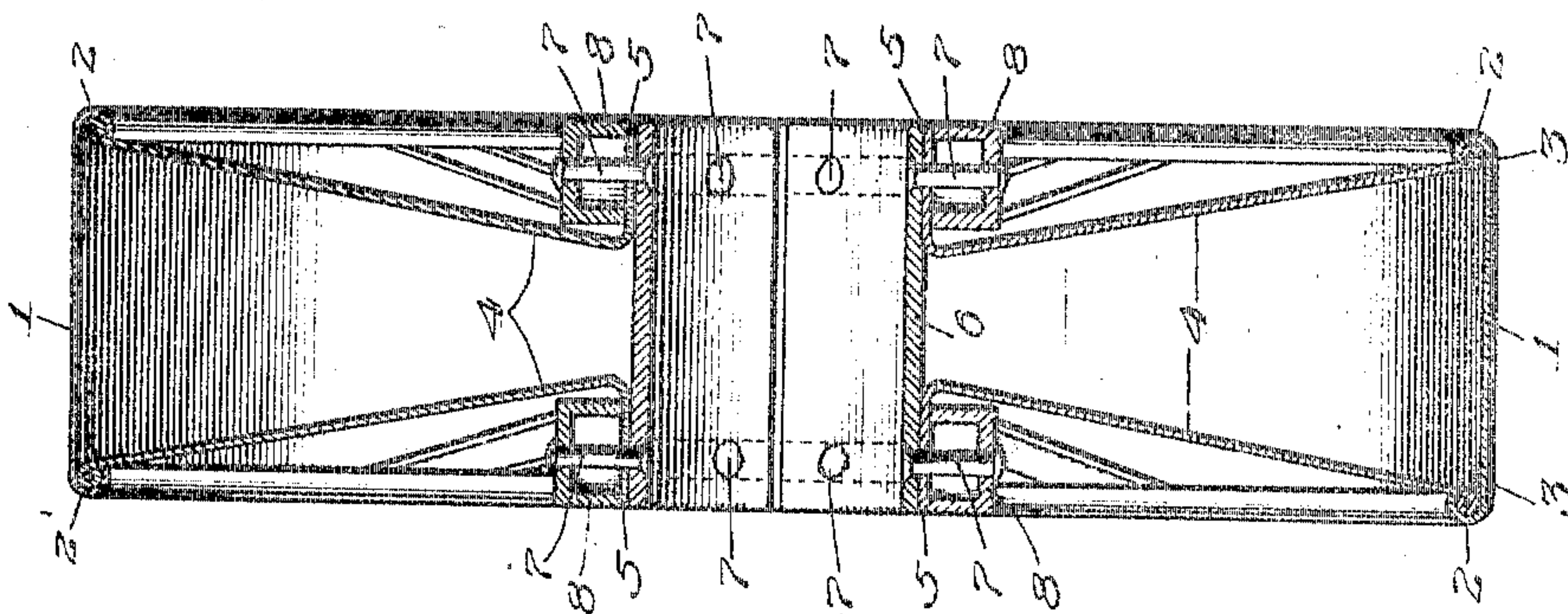
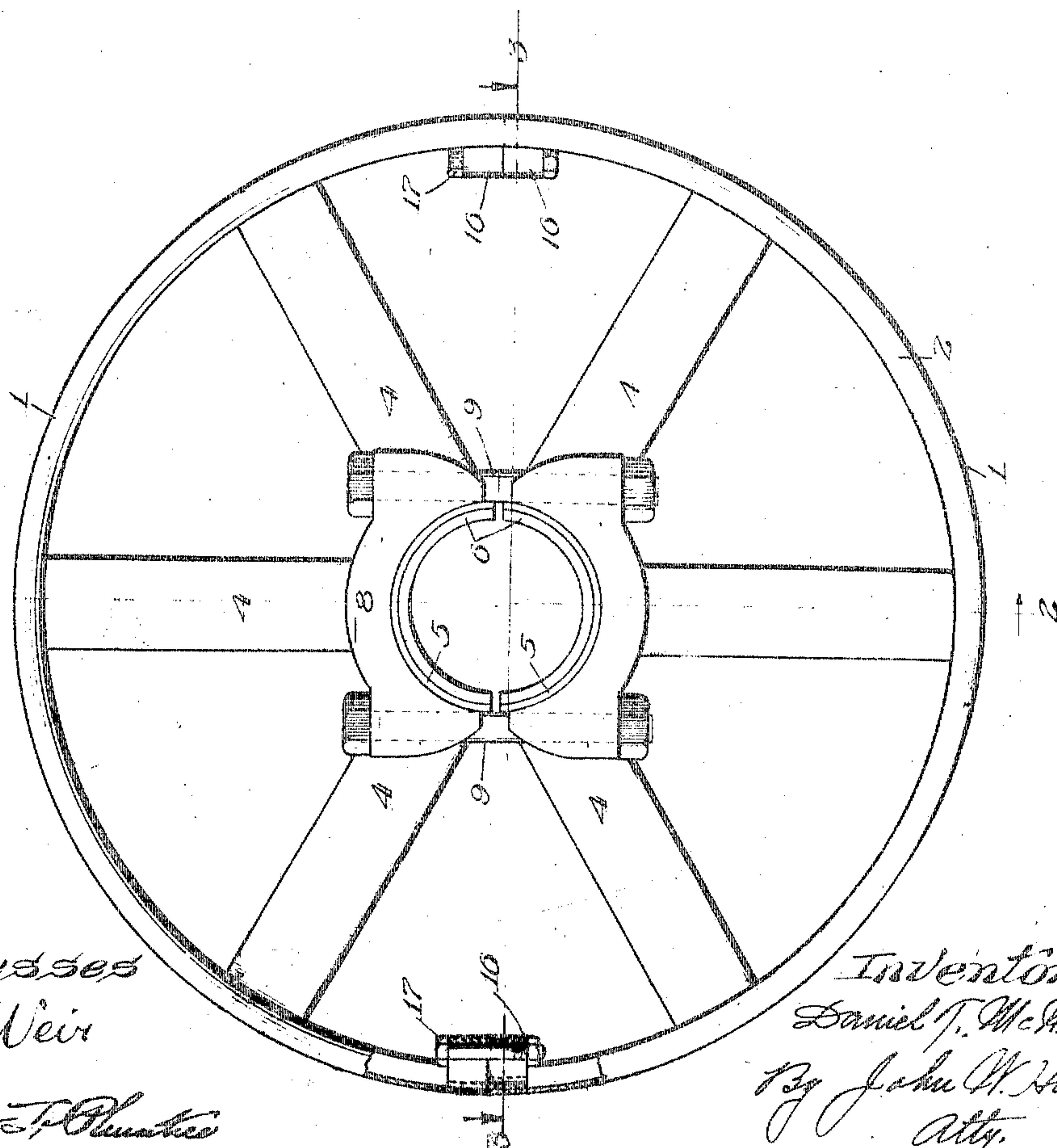


Fig. 1.



witnesses
J. B. Weir
Chas. T. Plunkett

Inventor
Daniel T. McNiel
By John W. Hill
Atty.

No. 817,439.

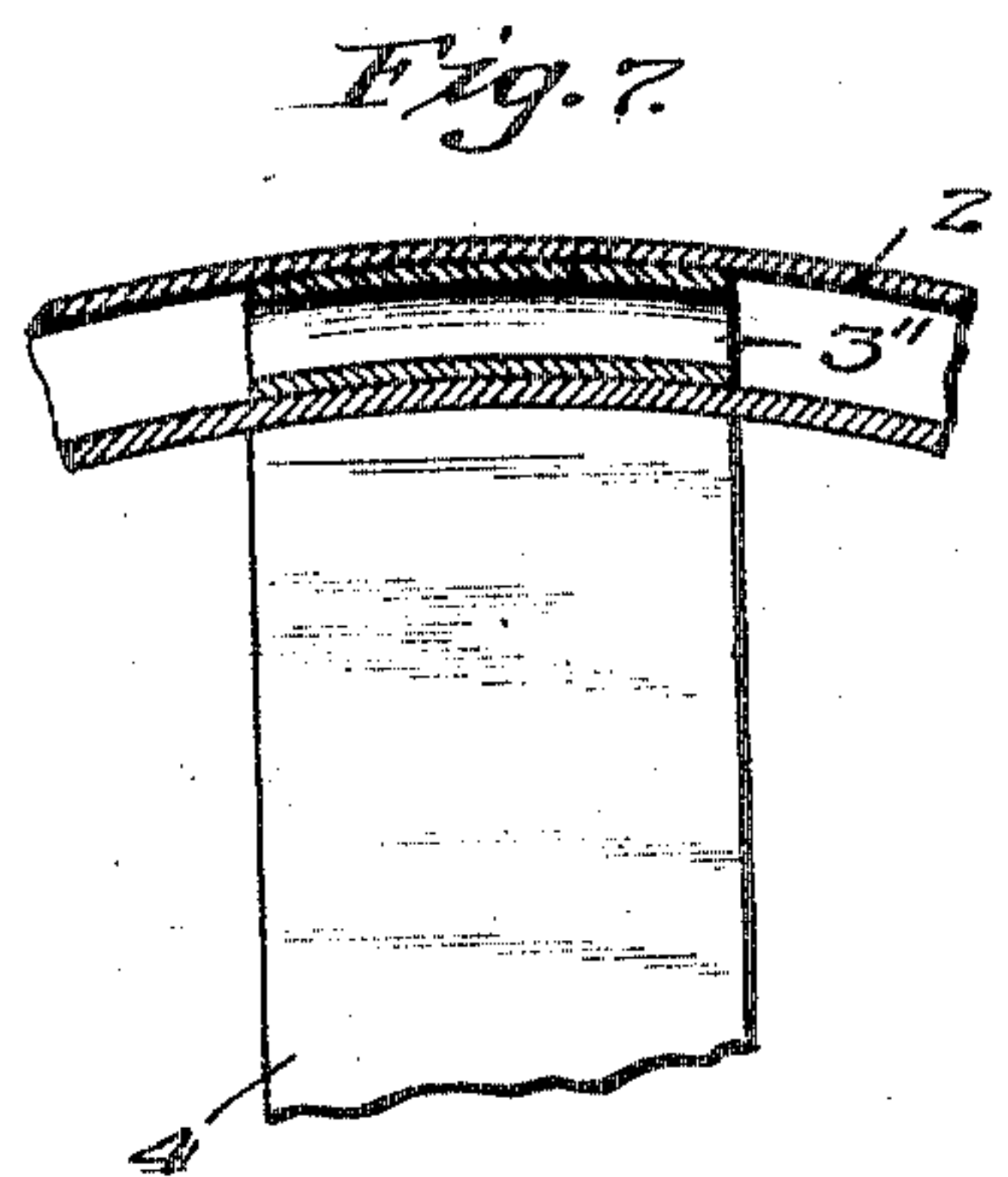
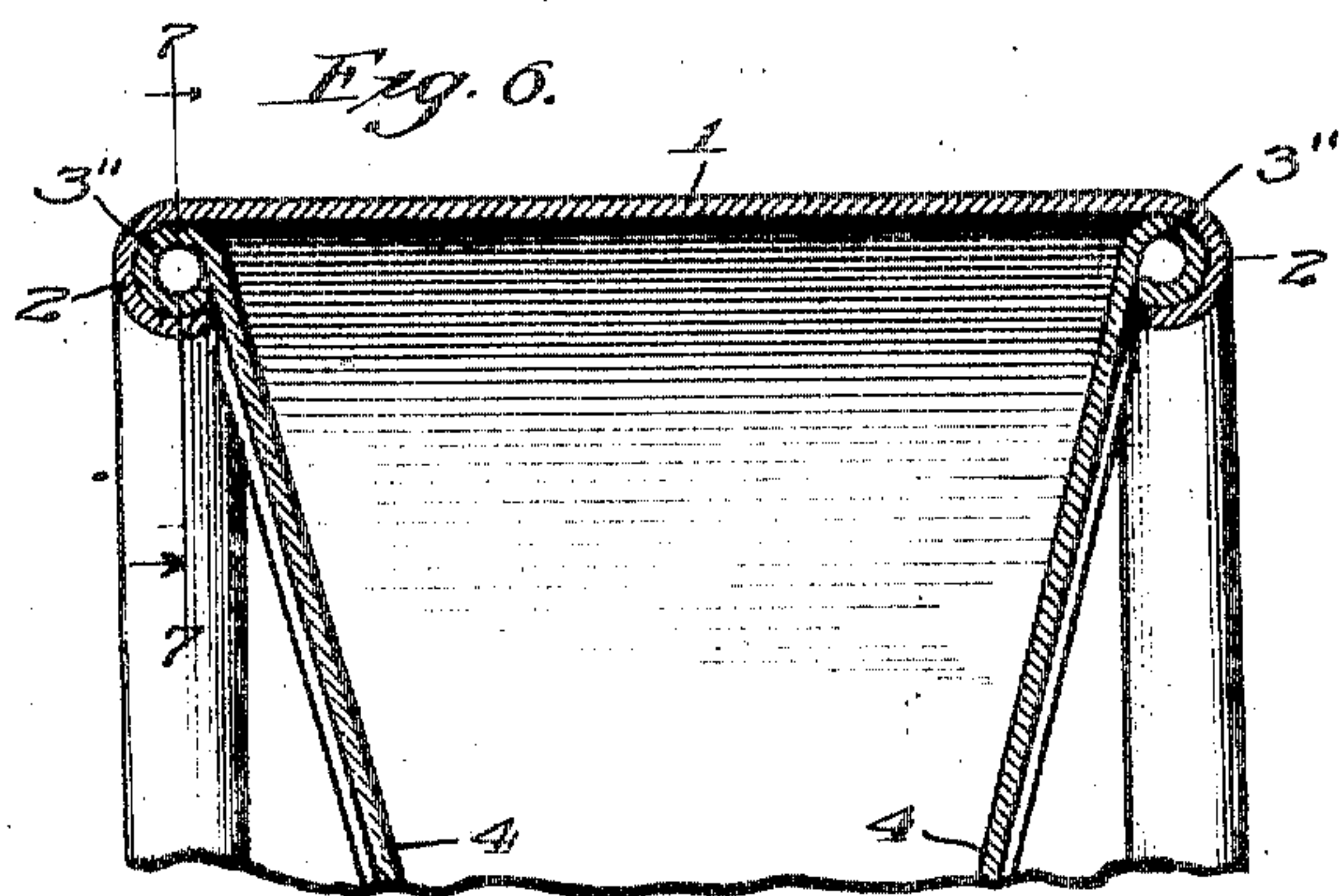
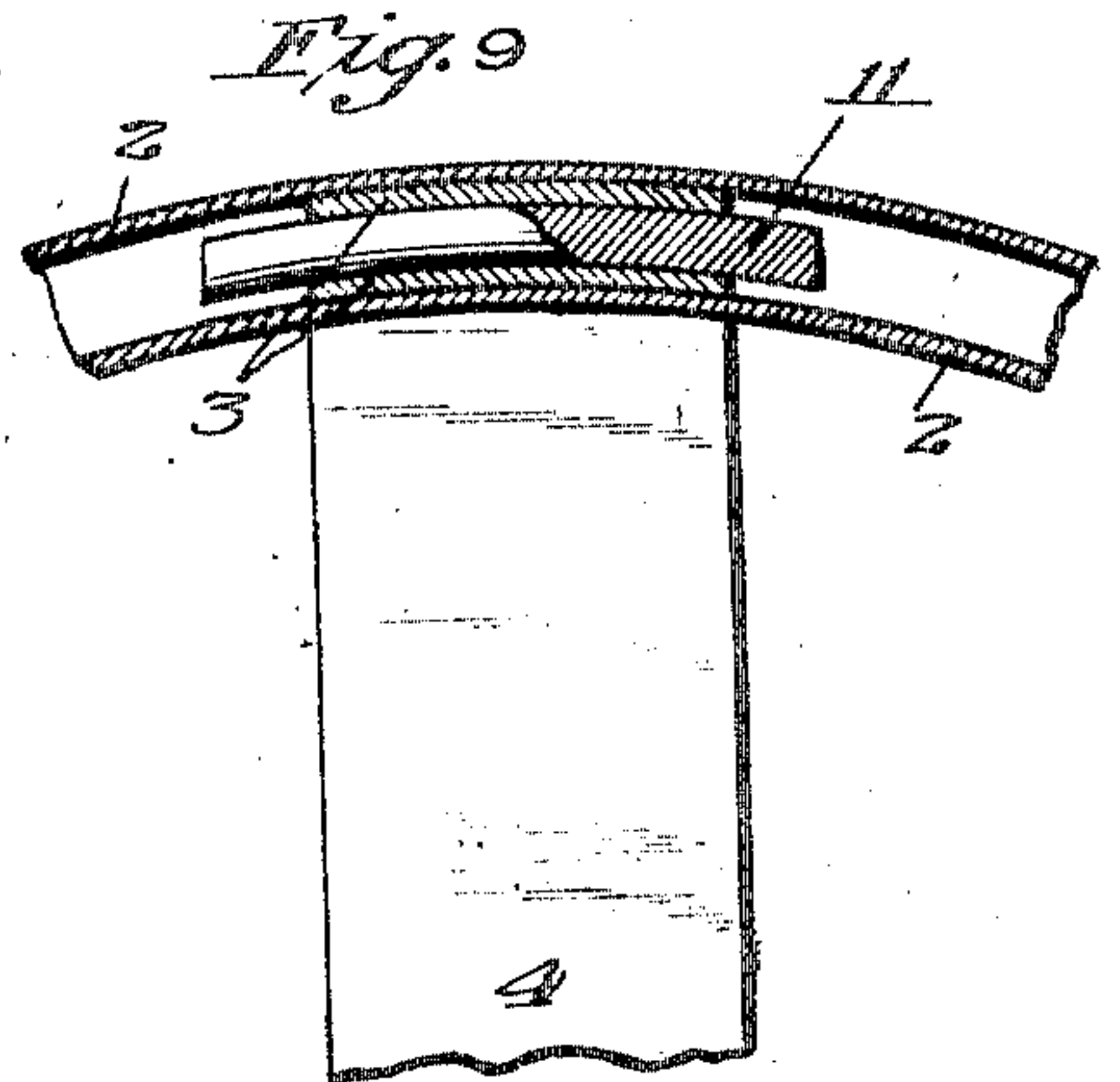
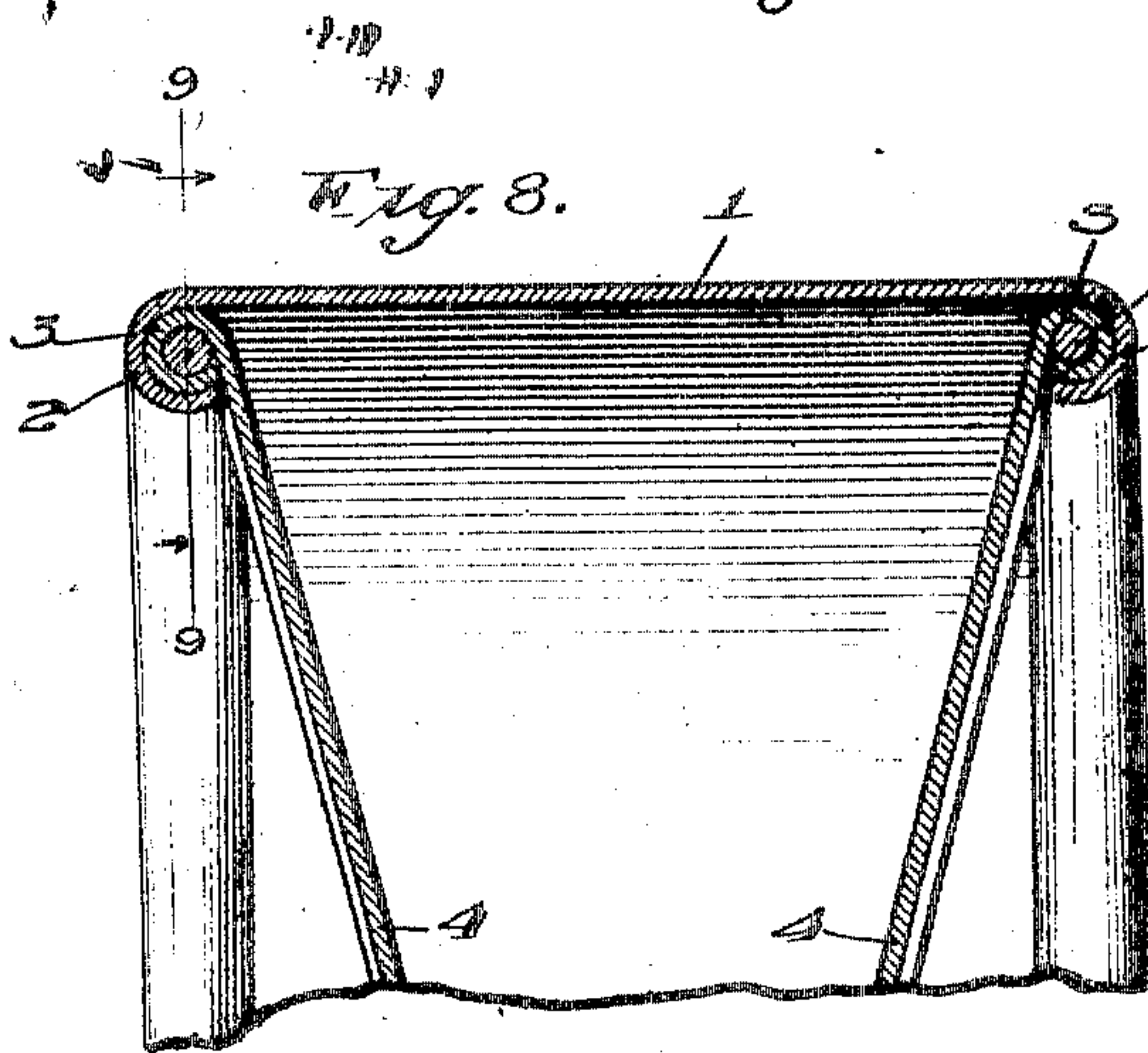
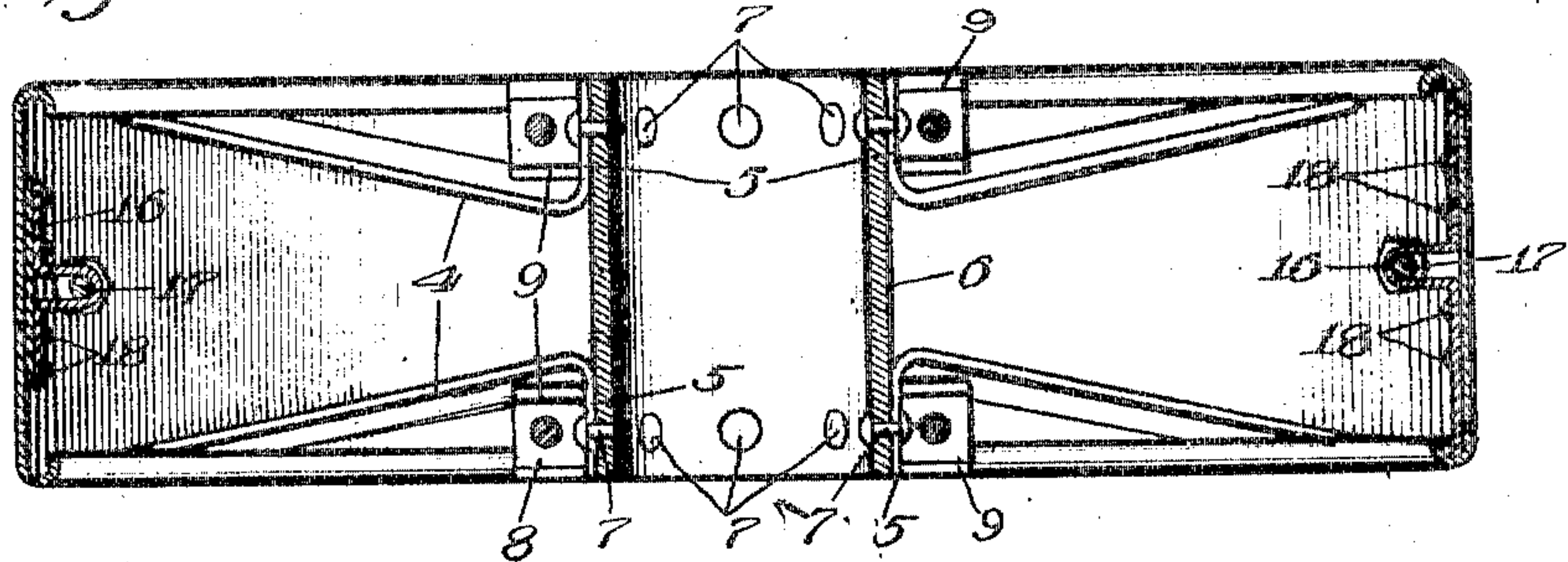
PATENTED APR. 10, 1906.

D. T. McNIEL.
BELT PULLEY.

APPLICATION FILED APR. 1, 1904.

4 SHEETS—SHEET 2.

Fig. 3.



Witnesses:

J. Weir
C. Plummer

Inventor:

Daniel T. McNiel
By John H. Hill
Atty.

No. 817,439.

PATENTED APR. 10, 1906.

D. T. McNIEL.

BELT PULLEY.

APPLICATION FILED APR. 1, 1904.

4 SHEETS—SHEET 3.

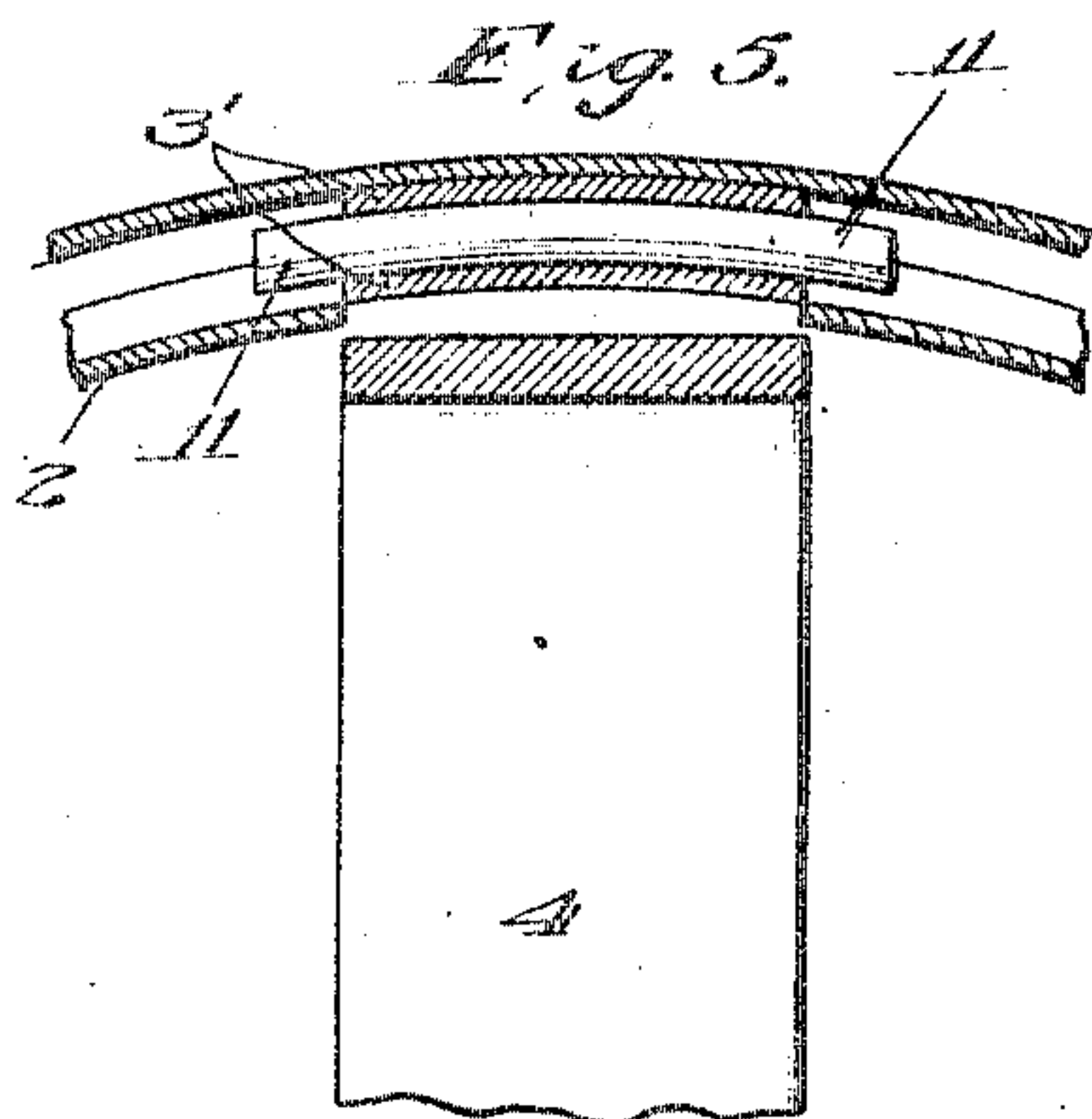
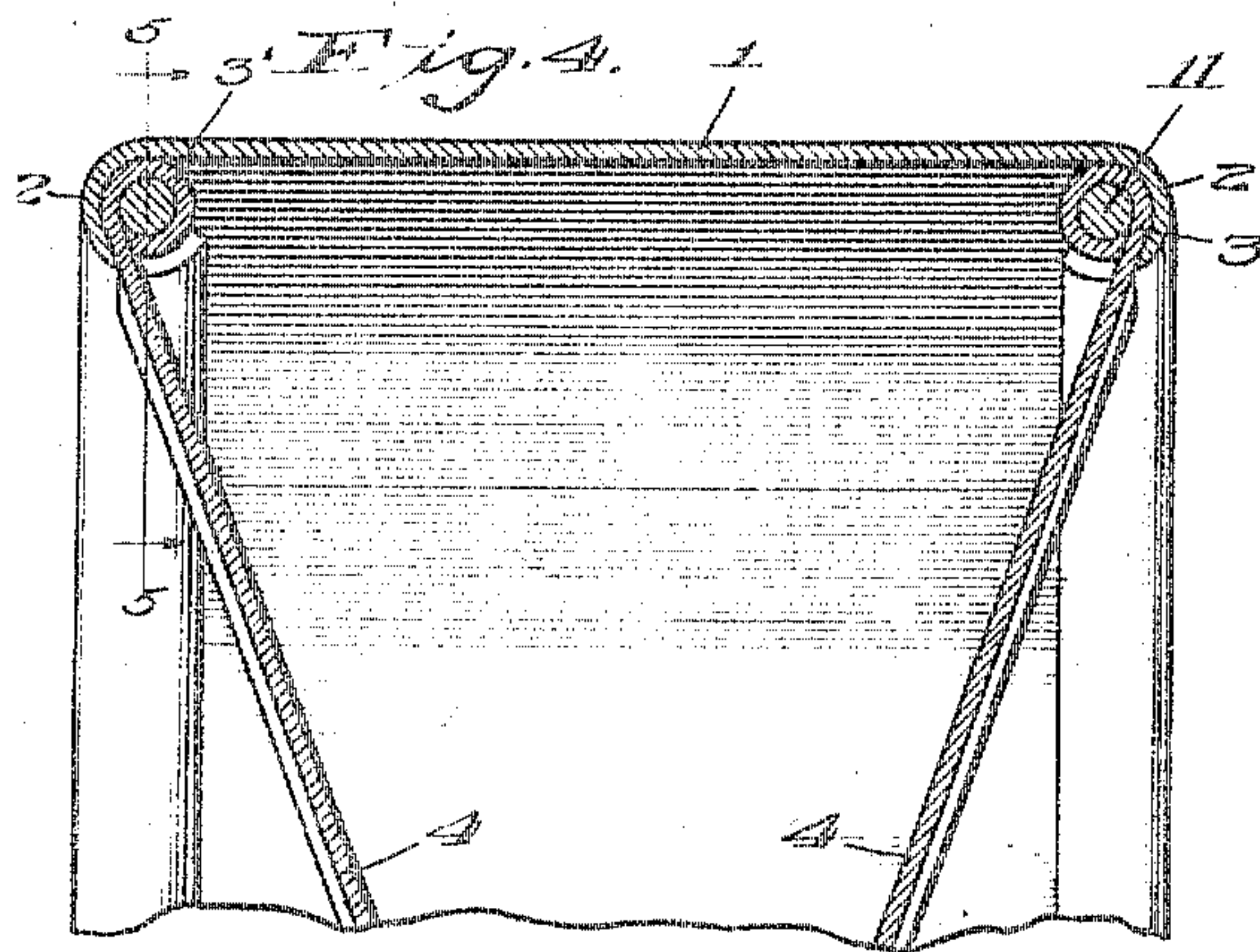


Fig. 10.

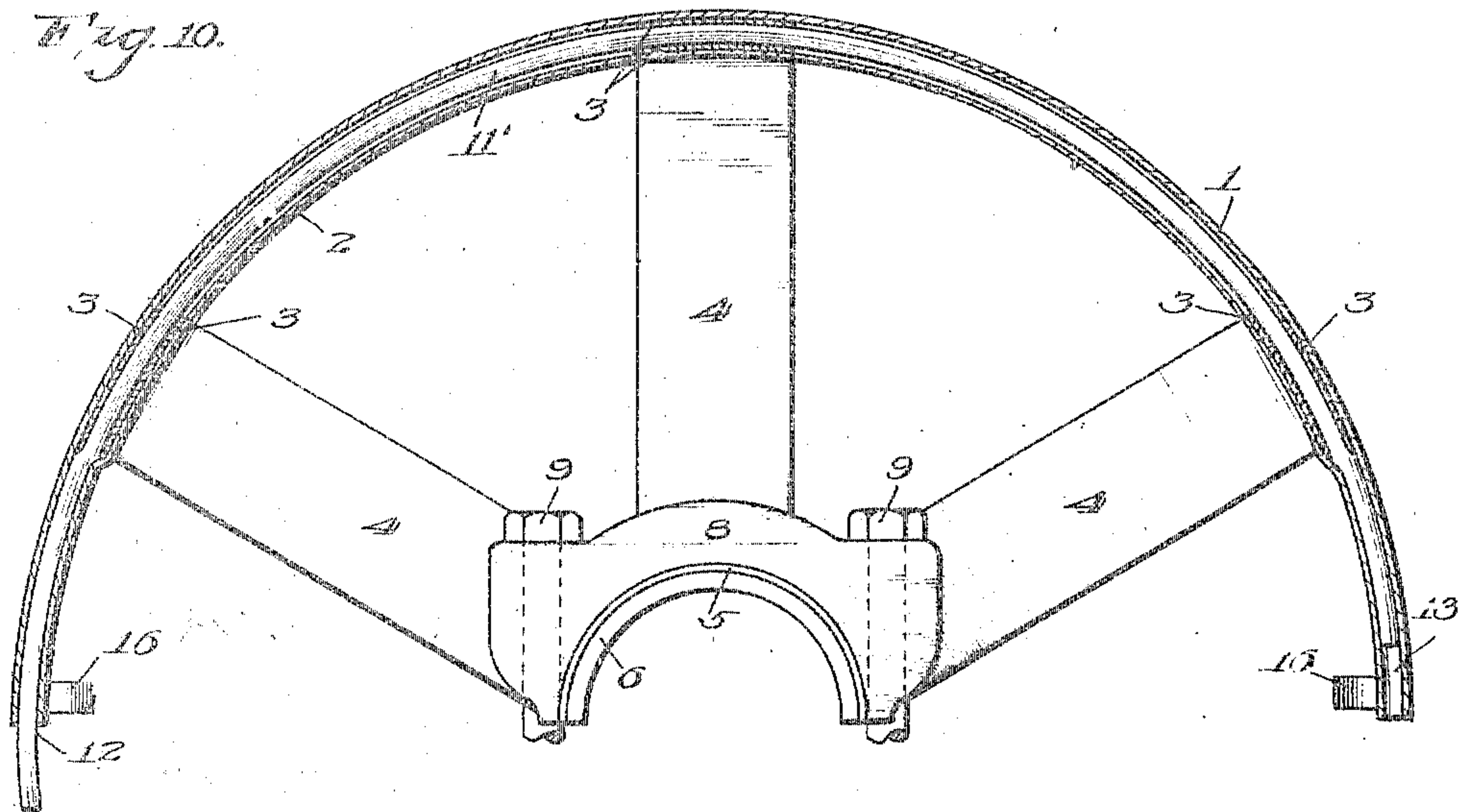
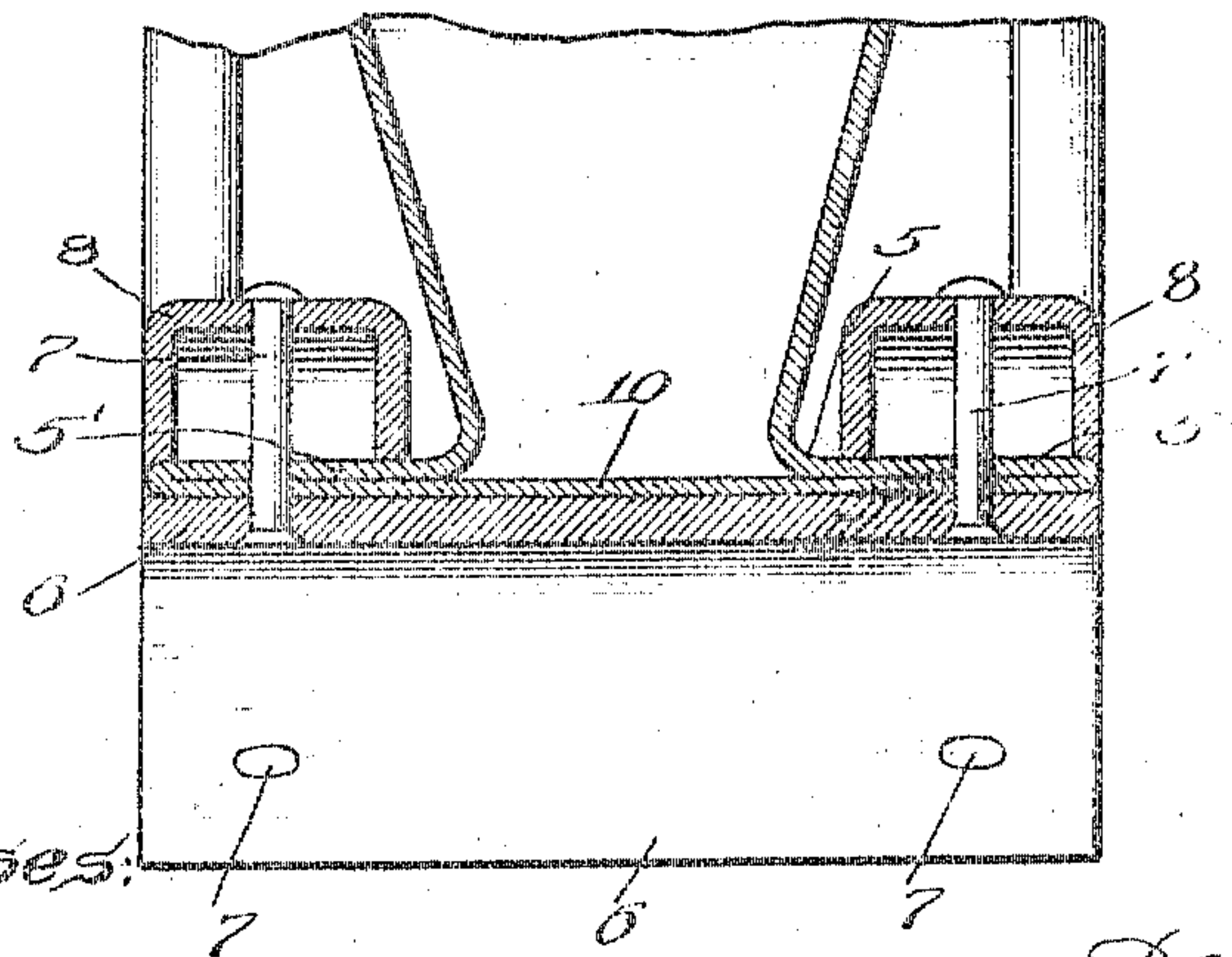


Fig. 11.



Witnesses:

J. B. Weir

J. B. Hunter

Inventor:

Daniel T. McNiel
By John W. Hill
Atty

No. 817,439.

PATENTED APR. 10, 1906.

D. T. McNIEL.
BELT PULLEY.

APPLICATION FILED APR. 1, 1904.

4 SHEETS—SHEET 4.

Fig. 12.

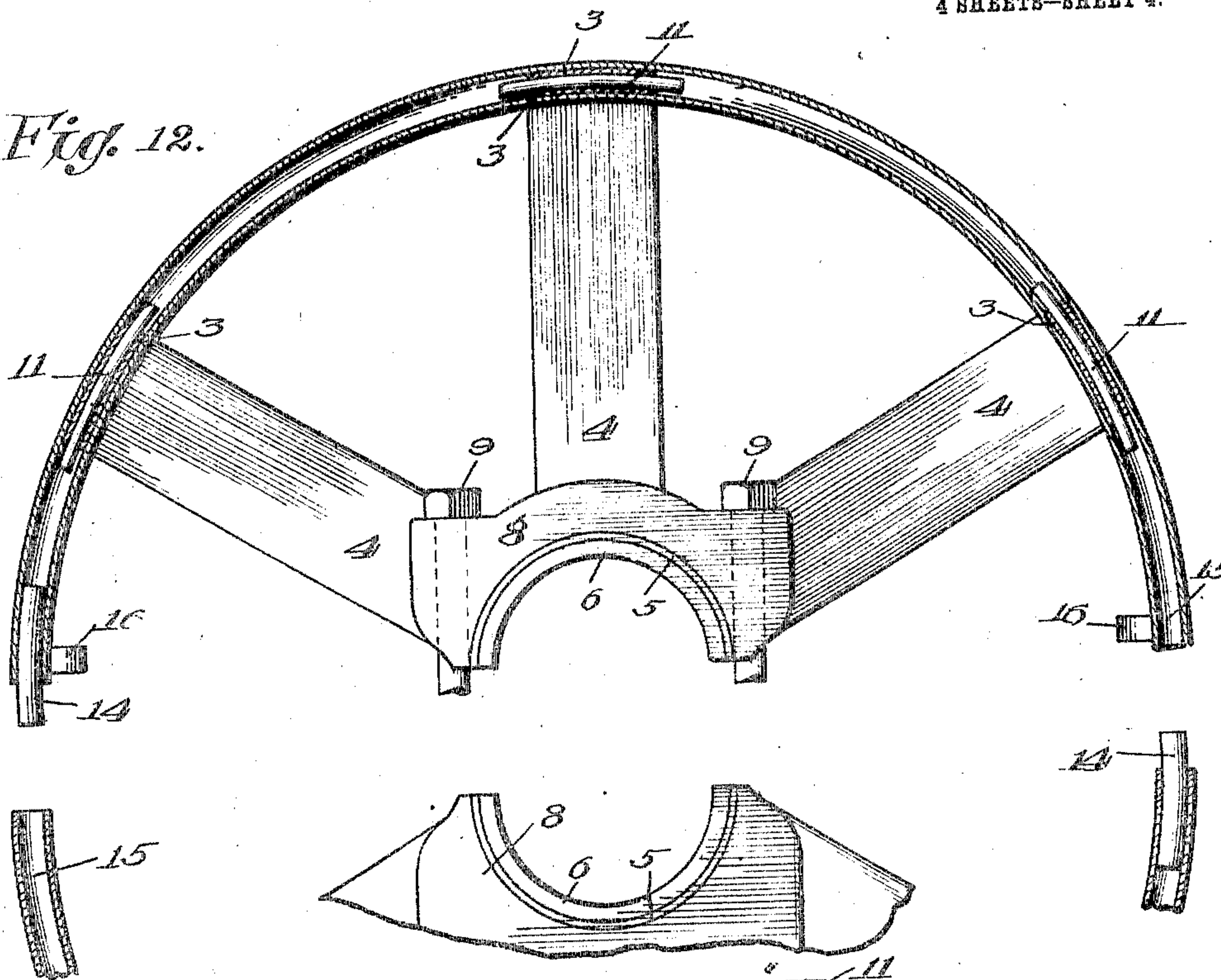
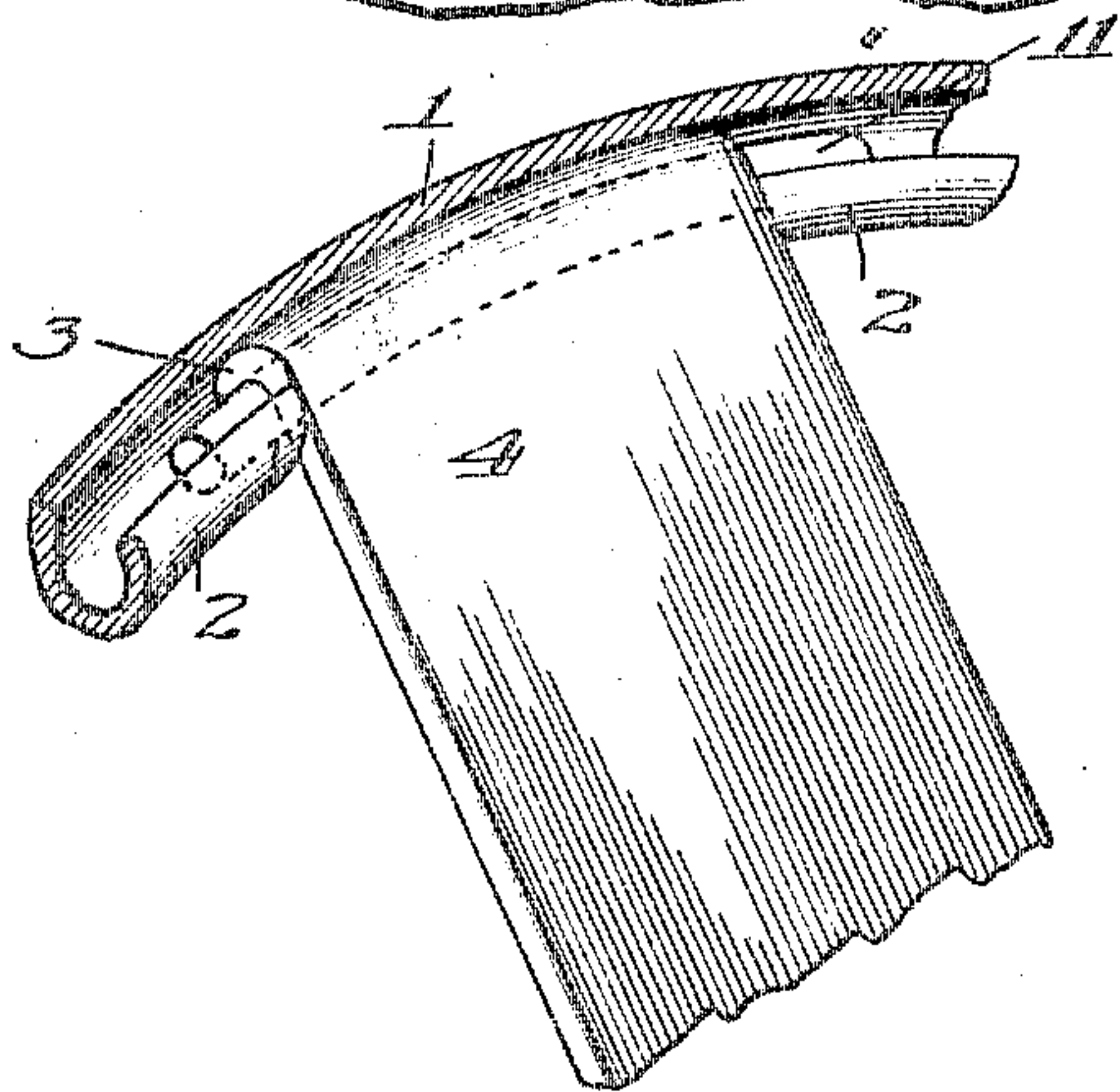


Fig. 13.



Witnesses:
J. B. Weir
C. J. Donnan.

Inventor:
Daniel T. McNiel
By John W. Hill
Atty.

UNITED STATES PATENT OFFICE.

DANIEL T. McNIEL, OF ANN ARBOR, MICHIGAN.

BELT-PULLEY.

No. 817,439.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed April 1, 1904. Serial No. 201,157.

To all whom it may concern:

Be it known that I, DANIEL T. McNIEL, a citizen of the United States of America, residing at Ann Arbor, county of Washtenaw, and State of Michigan, have invented certain new and useful Improvements in Belt-Pulleys, of which the following is a description.

My invention relates to that class of devices known as "belt-pulleys" adapted to be applied directly to a shaft or upon a bushing arranged between the shaft and the hub of the pulley.

The object of my invention is to produce a light, strong, and durable pulley composed wholly of metal or, if preferred, partly of metal and partly of wood.

To this end it consists in the novel construction, arrangement, and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the accompanying drawings, wherein like reference characters indicate like or corresponding parts, Figure 1 is an elevation of my pulley, parts being broken away. Fig. 2 is a section taken on line 2 2 of Fig. 1. Fig. 3 is a section taken on line 3 3 of Fig. 1. Fig. 4 is an enlarged partial section through the rim and two arms of a pulley and shows one method of forming the rim of my pulley and the manner in which the spoke ends may interlock therewith. Fig. 5 is a partial section taken on line 5 5 of Fig. 4. Fig. 6 is a similar section to that shown in Fig. 4, showing a modified arrangement of the spokes and their union with the rim. Fig. 7 is a partial section taken on line 7 7 of Fig. 6. Fig. 8 is a section similar to that shown in Fig. 4, showing the preferred manner of securing the spoke ends to the rim. Fig. 9 is a partial section taken on line 9 9 of Fig. 8. Fig. 10 is a section of a half-pulley, taken substantially on line 9 9 of Fig. 8, showing the hub in full lines. Fig. 11 is a partial section taken through the hub on line 2 2 of Fig. 1, showing a modification. Fig. 12 is a sectional view of one half of a pulley on substantially the line shown in Fig. 10, broken parts of the companion half of the pulley being shown to illustrate the method of assembling the parts; and Fig. 13 is a partial section of a part of the same, enlarged, to illustrate the attachment of the arms to the rim.

In the preferred form illustrated in the drawings a split or separable pulley is shown in which the parts may be disconnected to position the pulley on a shaft or to remove

the same therefrom without taking the latter out of its hangings.

As shown in all the figures, the rim 1 is of sheet metal, having its outer edges turned and bent inwardly to form a flange or bead 2, which not only stiffens the rim, but also serves as effective means for securing the outer ends 3 of the arms 4 thereto. The ends 3 of the arms are formed with beads complementary to the beads of the rim, adapted to be positioned in and be firmly gripped by the bead 2, whereby the parts are effectually united in making up the pulley.

The inner ends 5 of the arms are bent outwardly at an angle to be seated upon a hub or shell 6, to which they may be secured in any suitable manner. Thus the arms may be riveted to the shell 6, as shown in Figs. 2 and 3, or, if preferred, a part or all of the rivets may extend through the clamping-blocks 8, the ends 5, and shell 6 in each half-pulley, as shown in said Figs. 2 and 3, the hub members thus formed being adapted to be firmly secured together by bolts 9 9, uniting the clamps 8, as shown in Figs. 1, 3, 10, and 13. It is not essential, however, that the clamping-blocks shall be riveted upon the shell, as their position upon the outer ends of the shell is secure when they are bolted together, as hereinafter described. By this construction the arms, which are also preferably of sheet or wrought metal, consist of two sets having their outer ends firmly secured to the bead on each edge of the rim and thence converging both radially and transversely to the hub or shell, to which the inner ends are also firmly secured. This construction insures great strength in the pulley. In a split pulley of course the arm-sections on each side are also split or separable.

If desired, the arm-sections for each half-pulley may be integral, as shown in Fig. 11 at 5, in which the arms are bent backward upon the center web 10, leaving room within the plane of the edge of the rim of the pulley for the flange or clamping-blocks 8, as shown, and thence diverge to the rim edge, as before described.

To aid in securely locking the outer ends of the arms and the rims together, I prefer to roll the end of the arm outward and into the bead 2, as shown in Figs. 2, 3, 6, 7, 8, 9, and 13, and as an additional assurance of firm engagement of the parts I also prefer to notch the bead for the close reception of the ends 3 of the arm, as clearly shown in Figs. 1 and 4,

If desired, the ends 3 of the arms may be rolled inward to engage a rod 11, firmly seated in the bead, as shown at 3' in Figs. 4 and 5. In this construction the bead is also notched, as shown. The ends of the arms may be simply rolled into the bead, as shown at 3'' in Figs. 6 and 7, or the engagement may be modified by inserting a rod 11 either simply at the junction of the arms with the rim, as shown, or, if preferred, by extending the rod around the half-pulley, as shown at 11' in Fig. 10. In the latter form I prefer to permit the end of the rod to project, as at 12, and provide a corresponding recess at 13. By this means when the two halves of the pulley are assembled the meeting rims will be brought into and held securely in proper registry with each other. As shown in Fig. 10, the bead is crimped closely upon the rod, near the ends thereof, to aid in the function just described.

In Fig. 12 a similar function is preserved by securing a short section of rod 14 in each half of the pulley, which coöperates with a complementary recess 15 in the opposite half of the pulley. The firm union of the meeting rims of the pulley may also be aided by providing each with half of a clamp 16 and bolting the two firmly together by one or more bolts 17. These clamps may be simply riveted to the rim, as shown to the left in Fig. 3. In the preferred construction, however, the clamps are extended and the bead 2 rolled around the ends thereof. This may also be supplemented by rivets 18, if desired.

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

1. A belt-pulley comprising a sheet-metal rim having its outer edges formed with inwardly-extending beads, and a suitable hub, in combination with pulley-arms connecting the hub and rim, the outer ends of the several arms being positioned in notches formed in the beads in the rim and engaging with the beads, and means for securing the pulley to a shaft.

2. A split pulley comprising sheet-metal rim-sections adapted to form the complete rim, and having its outer edges provided with inwardly-extending beads having notches, a separable hub, and means for securing the hub to a shaft, in combination with pulley-arms connecting the hub-sections with the rim-sections, the outer ends of the several arms being positioned in the notches formed in the beads therefor and engaging with the beads.

3. A split pulley consisting of substantially duplicate sections, each comprising a semicircular rim and a hub-section, in combination with two convergent sets of arms formed of an integral piece of sheet metal the arms of each set being connected by an integral web, each set secured at one end near the outer edge of the rim and at the other to the hub-section, means for securing the sections to-

gether, and means for securing the pulley to the shaft.

4. A belt-pulley comprising a suitable rim, composed of sheet metal, with a volute bead formed upon each of its edges, and a hub, in combination with two sets of sheet-metal arms attached at one end to said rim by means of the beads, and at the other to the hub, and means for securing said pulley on the shaft.

5. A split pulley consisting of substantially duplicate sections, each comprising a semicircular rim-section, composed of sheet metal, with a volute bead formed upon each of its edges and a hub-section, in combination with two sets of sheet-metal arms attached at one end to said rim-section by means of the beads, and at the other to the hub-section, means for securing the sections together, and means for securing the pulley to the shaft.

6. A belt-pulley comprising a suitable rim, composed of sheet metal, with a volute bead formed upon each of its edges, and a hub, in combination with rods, two sets of sheet-metal arms, whose outer ends are formed upon said rods and adapted to be partially inclosed in said beads, to attach said arms to said rim, and whose inner ends are attached to said hub, and means for securing said pulley on the shaft.

7. A split pulley, consisting of substantially duplicate sections, each comprising a semicircular rim-section, composed of sheet metal, with a volute bead formed upon each of its edges, and a hub-section, in combination with rods, two sets of sheet-metal arms whose outer ends are formed upon said rods and adapted to be partially inclosed and retained in position in said beads, to attach said arms to said rim-sections, hub members attached to said arms, means for securing the sections together, and means for securing said pulley to the shaft.

8. In a pulley, sheet-metal pulley-arms formed in two integral convergent sets, the ends of the arms of each set being adapted for attachment near the edge of a pulley-rim, and having an outwardly-projecting flange formed at the hub, adapted to connect with and be secured to other hub members, the flanges of the two sets being integrally connected by an axially-disposed return-bend.

9. In a split pulley, sheet-metal arms formed in integral sets two sets being required in each half-pulley, the ends of the arms of each set being adapted for attachment near the edge of a pulley-rim section, the sets converging toward the hub and each having an outwardly-projecting flange adapted to connect with and be secured to other hub members, and the flanges of the opposite sets being integrally connected by an axially-disposed return-bend.

10. In a split pulley, sheet-steel pulley-arms formed in two integral convergent sets,

the ends of the arms of each set being adapted for attachment near the edge of a pulley-rim, and having an outwardly-projecting flange formed at the hub, adapted to connect
5 with and be secured to other hub members, and the flanges of the opposite sets being integrally connected by an axially-disposed return-bend.

11. A pulley provided with a rim having
10 beads at its edges, and oppositely-arranged series of spoke-arms diverging outwardly and having complementary beads at their outer ends, fitting the beads of the rim.

12. A pulley provided with a rim having
15 beaded portions, and oppositely-arranged series of spoke-arms diverging outwardly and having complementary beaded outer ends fitting said beaded portions, of the rim.

13. A pulley provided with a rim having
20 notched beaded portions and spoke-arms fitting said beaded portions of the rim and confined against edgewise movement by the walls of the notches.

14. A pulley provided with a rim having
25 notched beaded portions and spoke-arms having complementary beaded outer ends fitting said beaded portions of the rim and confined against edgewise movement by the walls of the notches.

15. A pulley provided with a rim having
30 beaded portions and spoke-arms having complementary beaded outer ends fitting said beaded portions of the rim, in combination with securing means auxiliary to the beads in engagement with the beaded outer ends of
35 the arms.

16. A pulley provided with a rim having
40 beaded portions and spoke-arms having complementary beaded outer ends fitting said beaded portions of the rim, in combination with a securing-rod in engagement with the beaded outer end of each arm.

17. A pulley provided with a rim having
45 beaded portions and spoke-arms having complementary beaded outer ends fitting said beaded portions of the rim, in combination with a securing-rod in engagement with the beaded outer end of each arm and inclosed by the beaded portions of the rim.

18. A pulley provided with a rim having
50 its edges inwardly flanged with the margins bent inwardly and notched to receive the ends of spoke-arms, in combination with spoke-arms having the outer ends formed to
55 seat upon the flanges and secured thereto, and confined against edgewise movement by the walls of the notches.

19. A split pulley comprising sheet-metal
60 rim-sections adapted to form the complete rim, each having the outer edges inwardly flanged and notched, a separable hub, and means for securing the hub on a shaft, in combination with pulley-arms connecting the hub-sections with the rim-sections, the
65 outer ends of the several arms being posi-

tioned in the notches and secured to the flanges.

20. A split pulley comprising metal rim-sections adapted to form a complete rim and having the outer edges inwardly flanged with
70 the margins inwardly turned and provided with notches to receive the ends of the spoke-arms, a separable hub, and means for securing the hub on a shaft, in combination with pulley-arms connecting the hub-section to
75 the rim-section the outer ends of the several arms being positioned in the notches, and firmly secured to the flanges.

21. A pulley provided with a metal rim having its edges inwardly flanged and notched
80 to receive the ends of the spoke-arms, in combination with spoke-arms having the outer ends formed to seat upon the inner face of the rim and the flanges and secured thereto, and confined against edgewise movement by
85 the walls of the notches.

22. A metal pulley provided with a rim having its edges inwardly flanged with the margins inwardly bent and notched to receive the ends of the spoke-arms, in combination with metal spoke-arms having the
90 outer ends formed to seat upon the flanges and thence to extend in contact with the inner face of the rim and secured in such position and confined against edgewise movement
95 by the walls of the notches.

23. A split pulley comprising sheet-metal rim-sections adapted to form the complete rim, each having the outer edges inwardly flanged and notched, a separable hub, and
100 means for securing the hub on a shaft, in combination with pulley-arms connecting the hub-sections to the rim-section, the outer ends of the several arms being positioned in the notches and having portions bent inward
105 and in contact with the inner face of the rim, said arms being secured to the flanges.

24. A pulley of the character described comprising a rim, a hub, and sheet-metal spokes, said spokes having outwardly-turned
110 flanges secured to the hub and extending outwardly to the edges of the rim and also having inwardly-turned flanges secured to said rim, the spokes at one side of the pulley converging inwardly toward those of the opposite side thereof.
115

25. A pulley of the character described comprising a rim, a hub, and sheet-metal spokes secured to the hub and extending outwardly to the edges of the rim and having inwardly-turned flanges secured to said rim, the spokes at one side of the pulley converging inwardly toward those of the opposite side thereof.
120

26. A pulley of the character described
125 composed of a plurality of sections, each section comprising a rim portion, a hub portion, and oppositely-disposed series of sheet-metal spokes, the spokes of each series being integrally formed and connected at their inner
130

ends to the hub portion, and the oppositely-disposed series of spokes diverging outwardly relative to each other, to the outer edges of the rim portion and secured thereto.

5 27. In a pulley of the character described, a hub, a rim, and oppositely-disposed series of sheet-metal spokes the spokes of each series being integrally formed and connected at their inner ends to the hub, and the oppositely-disposed series of spokes diverging out-

wardly relative to each other to the outer edges of the rim and secured thereto.

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

DANIEL T. McNIEL.

Witnesses:

HENRY SCHNIEBLE,
GEO. H. KINSEY.