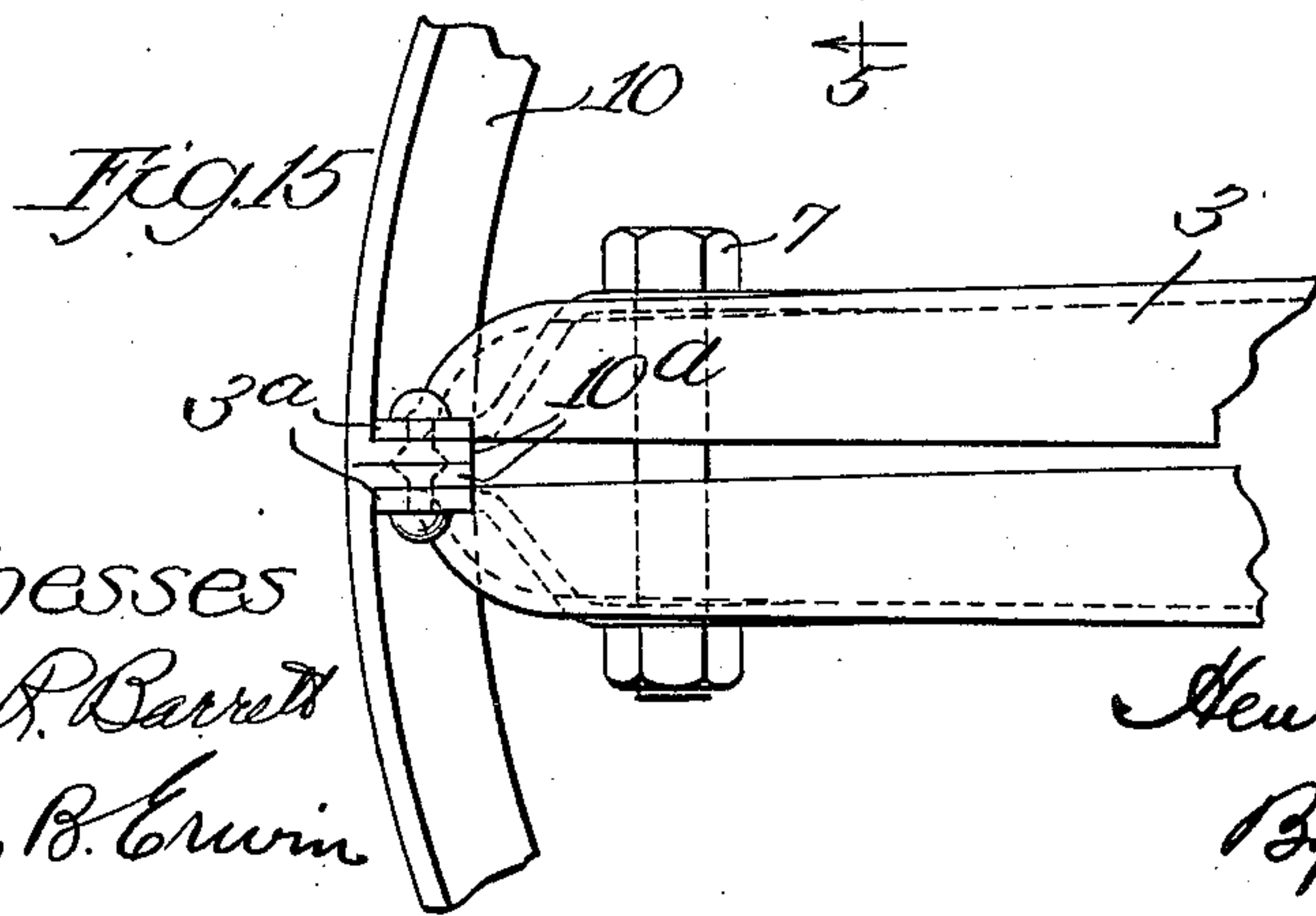
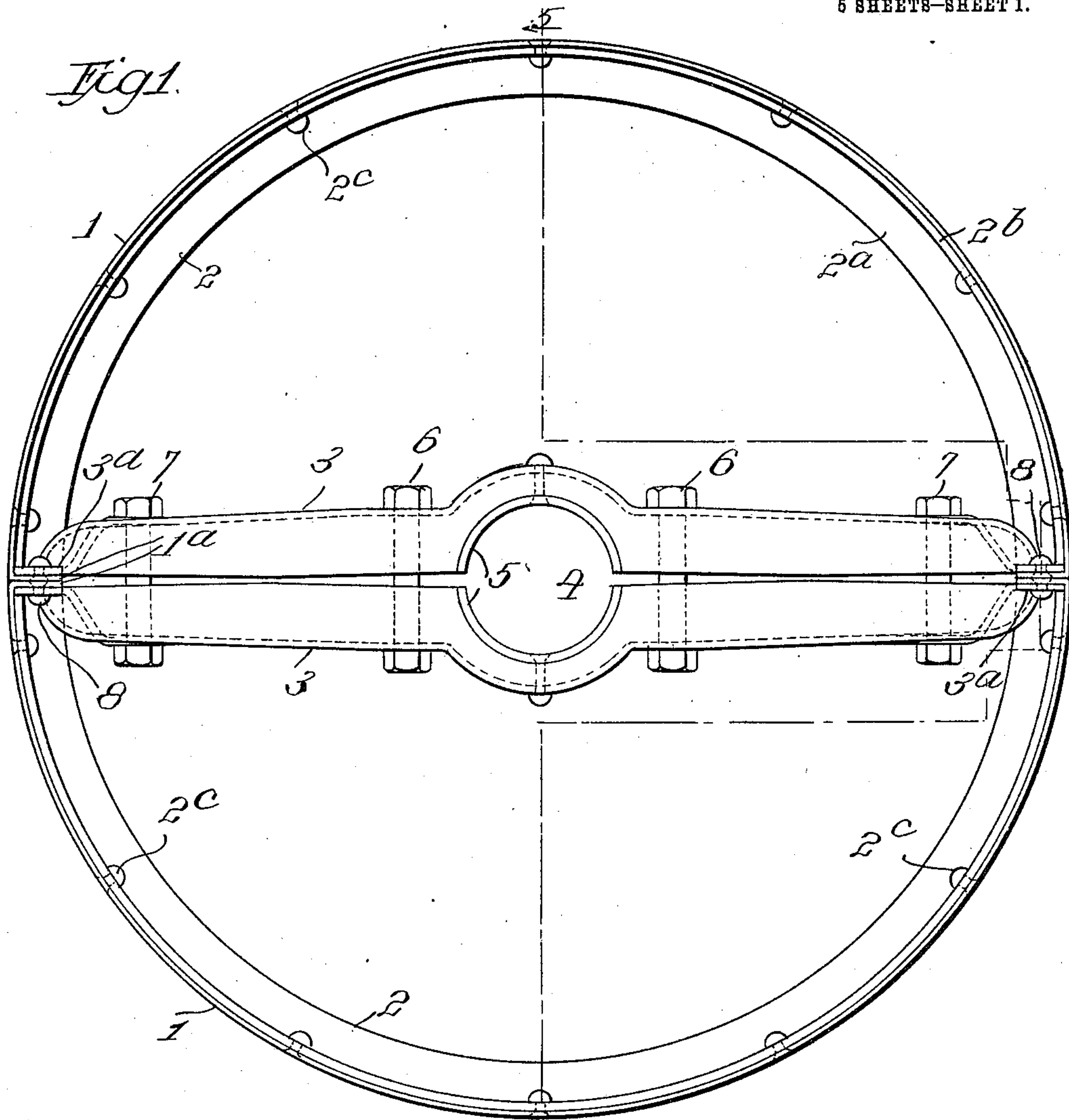


PULLEY.

Patented Aug. 1, 1911.

5 SHEETS—SHEET 1.

999,446.



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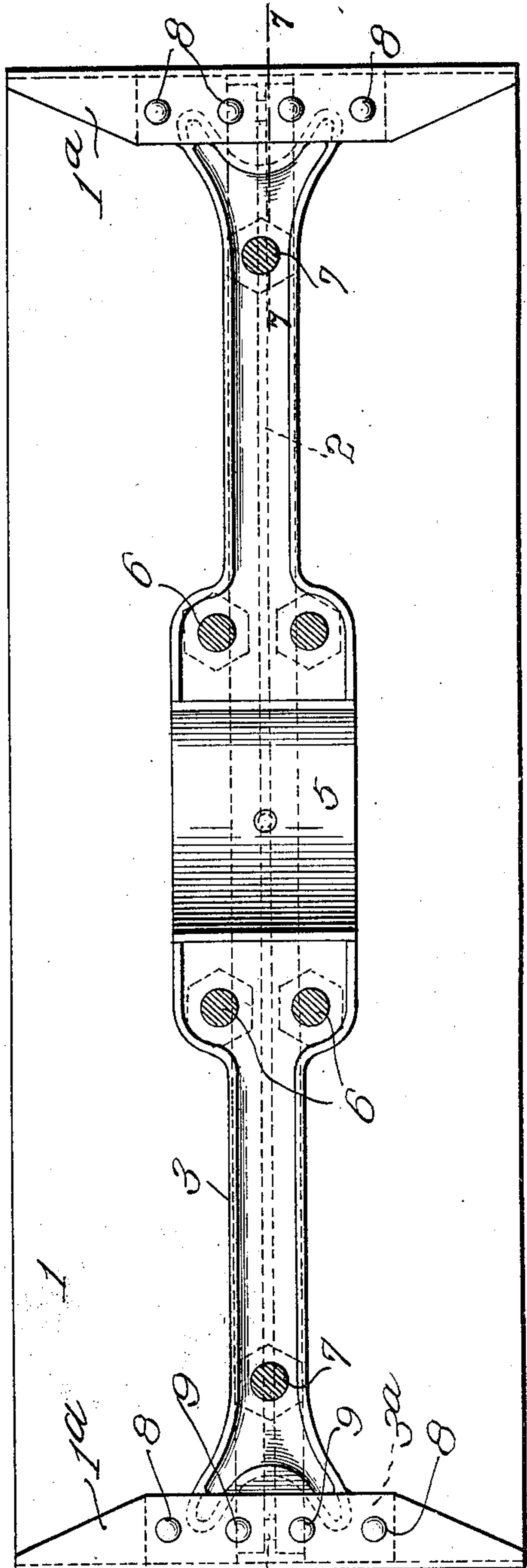
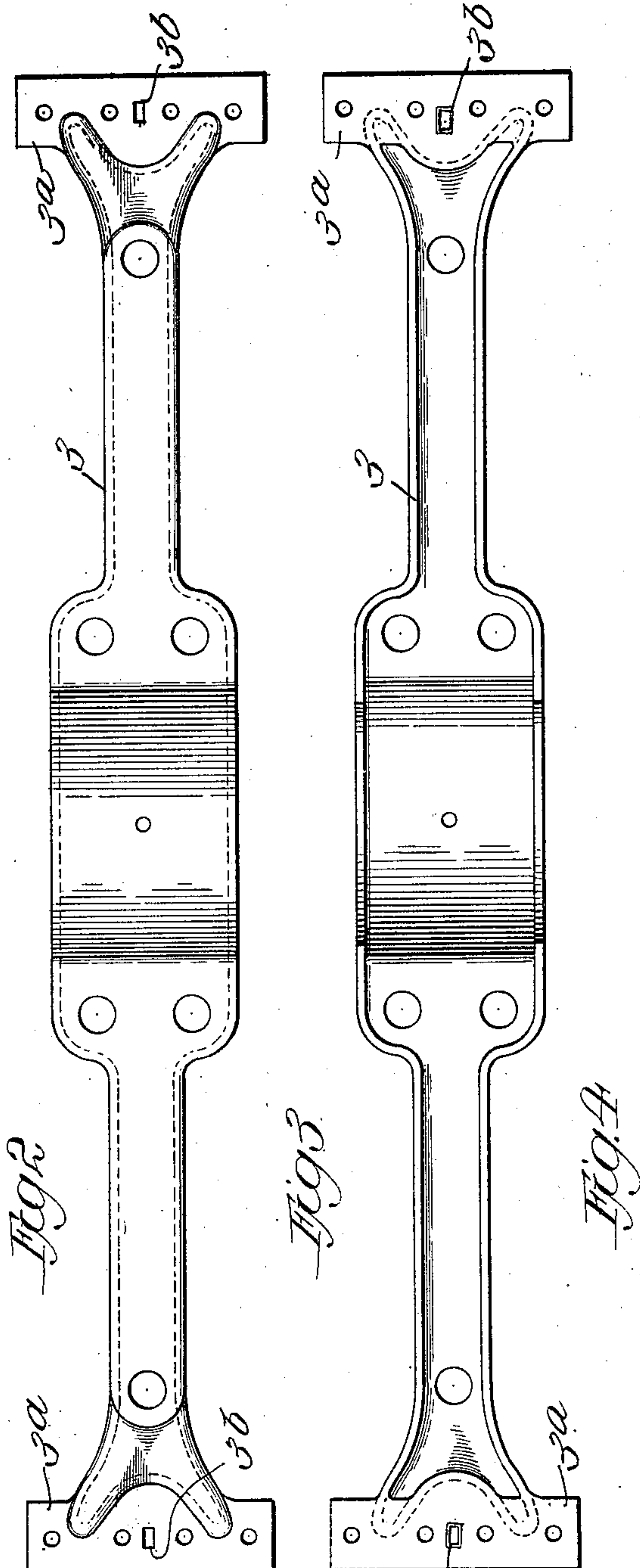
PULLEY.

APPLICATION FILED SEPT. 2, 1904.

Patented Aug. 1, 1911.

5 SHEETS—SHEET 2.

999,446.



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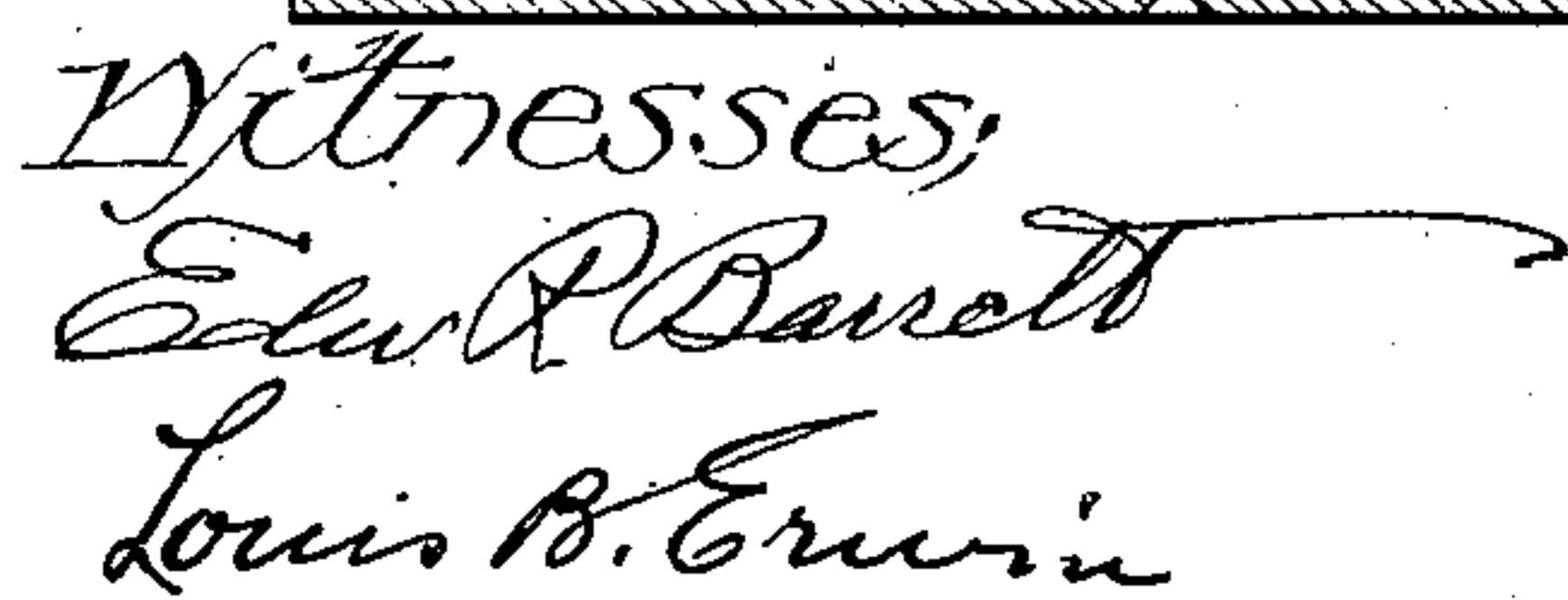
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PULLEY.

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5 SHEETS—SHEET 3.

Fig 5.



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PULLEY.

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5 SHEETS—SHEET 4.

999,446.

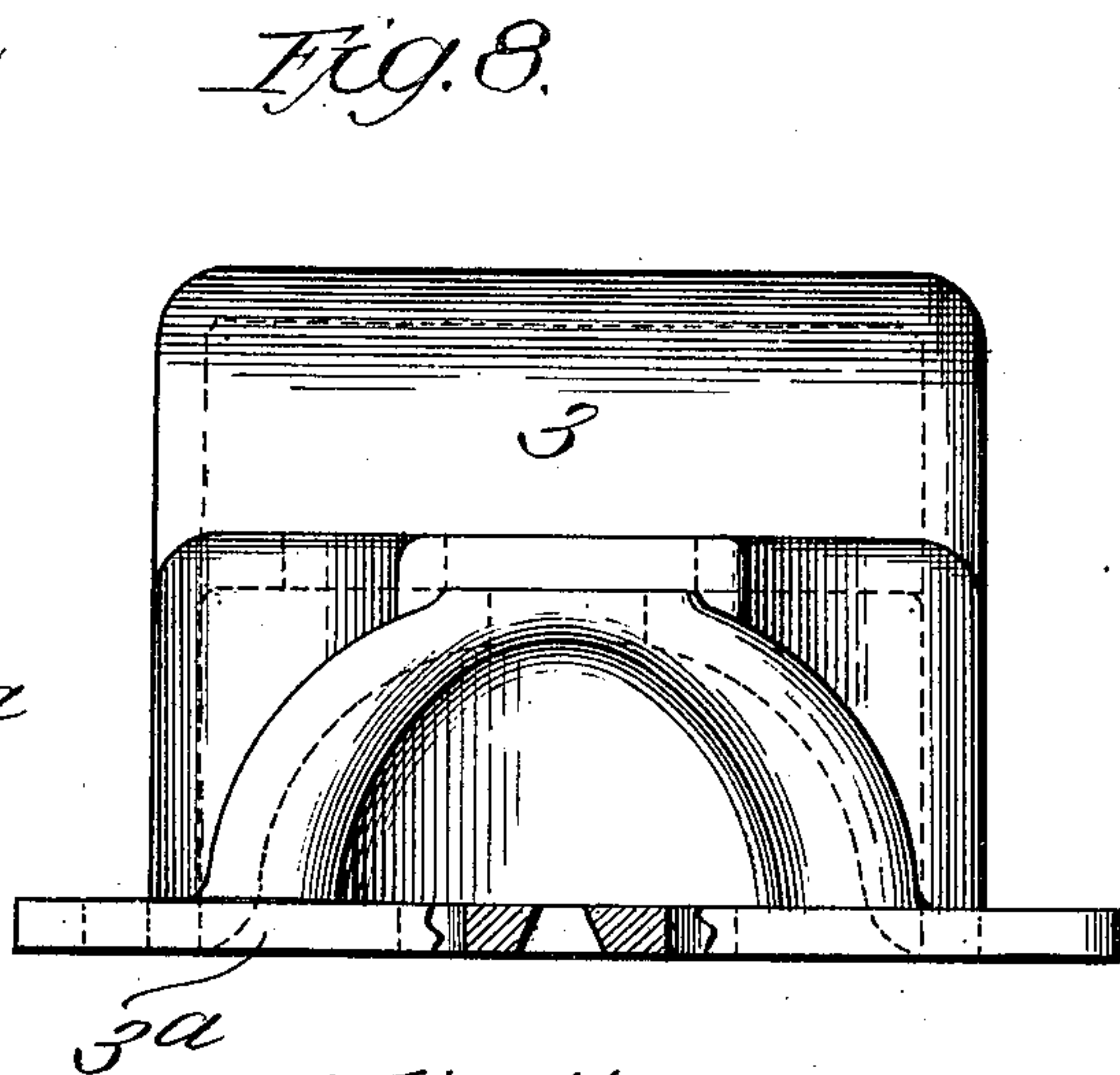
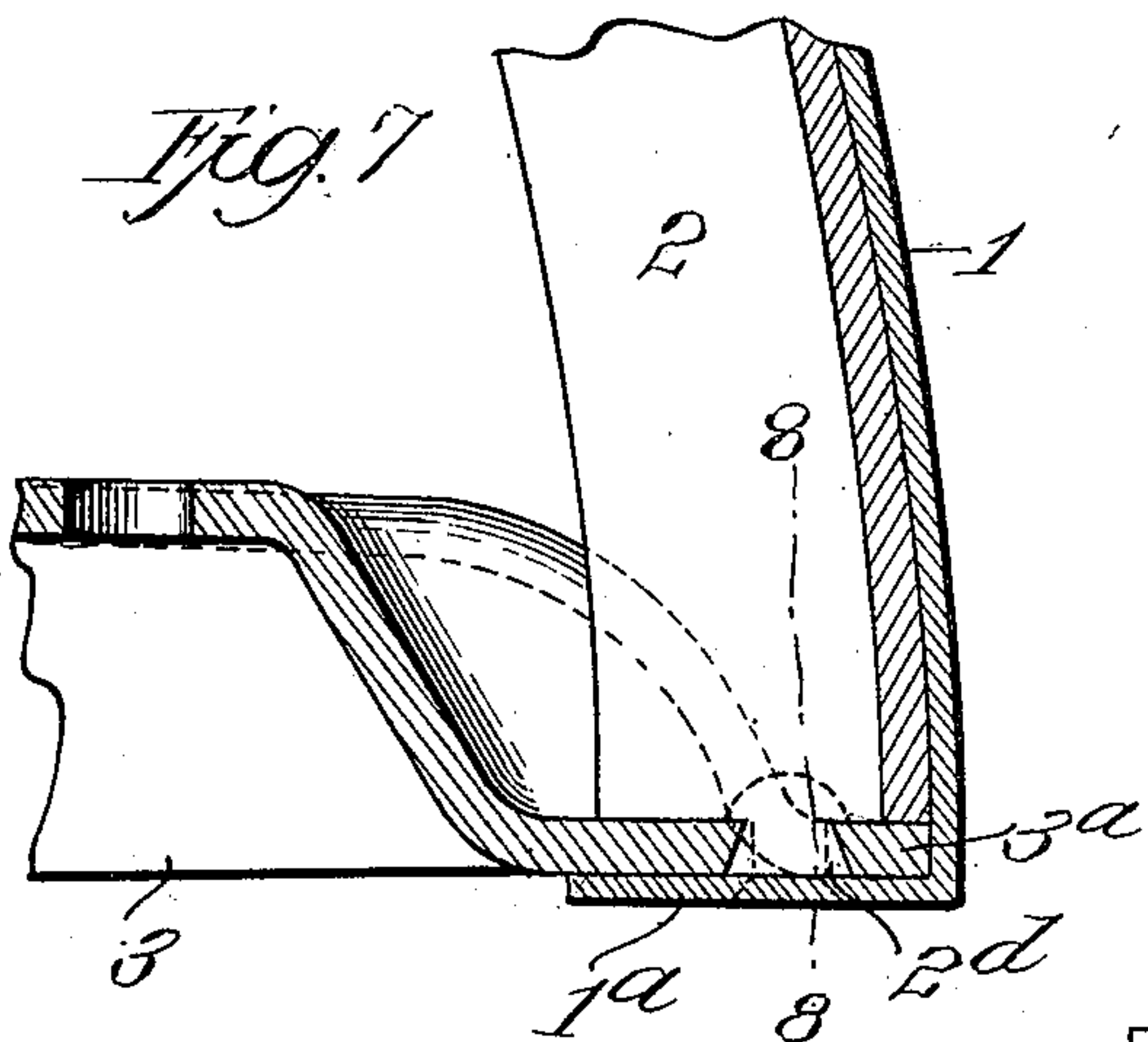


Fig. 9

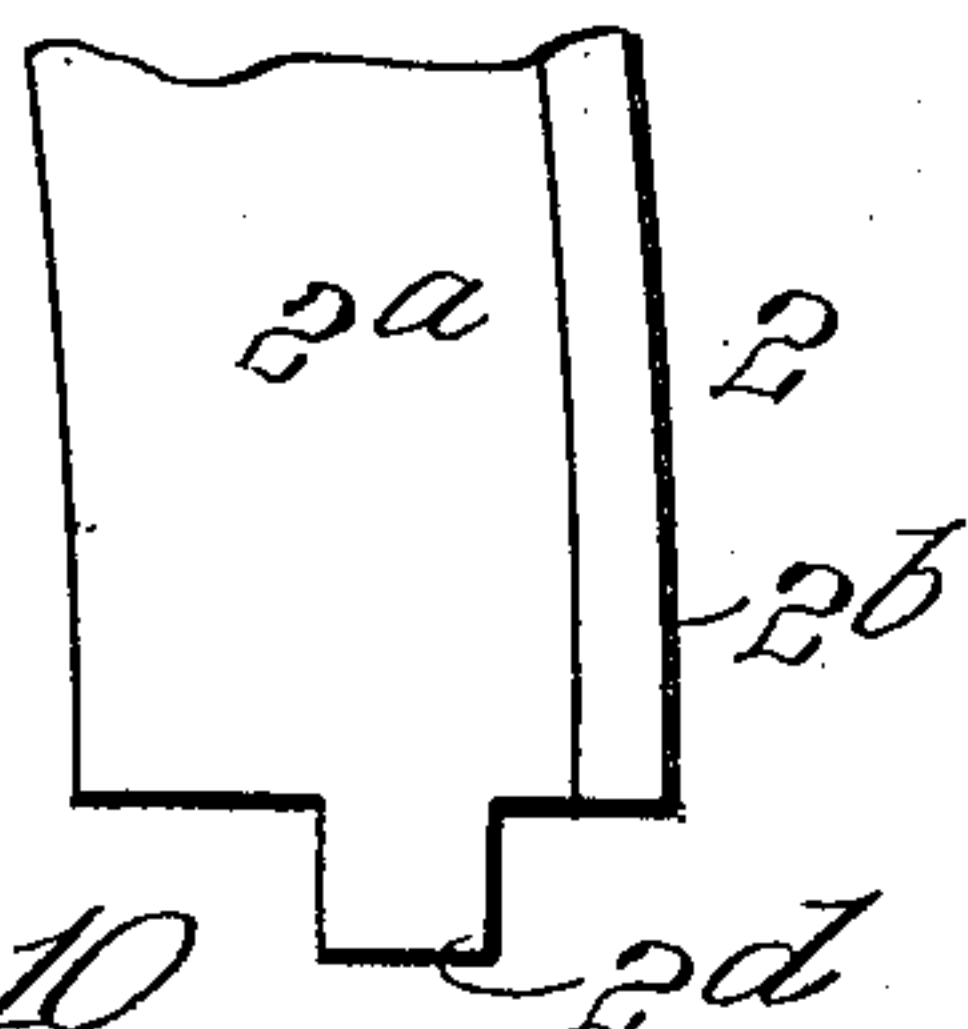


Fig. 10

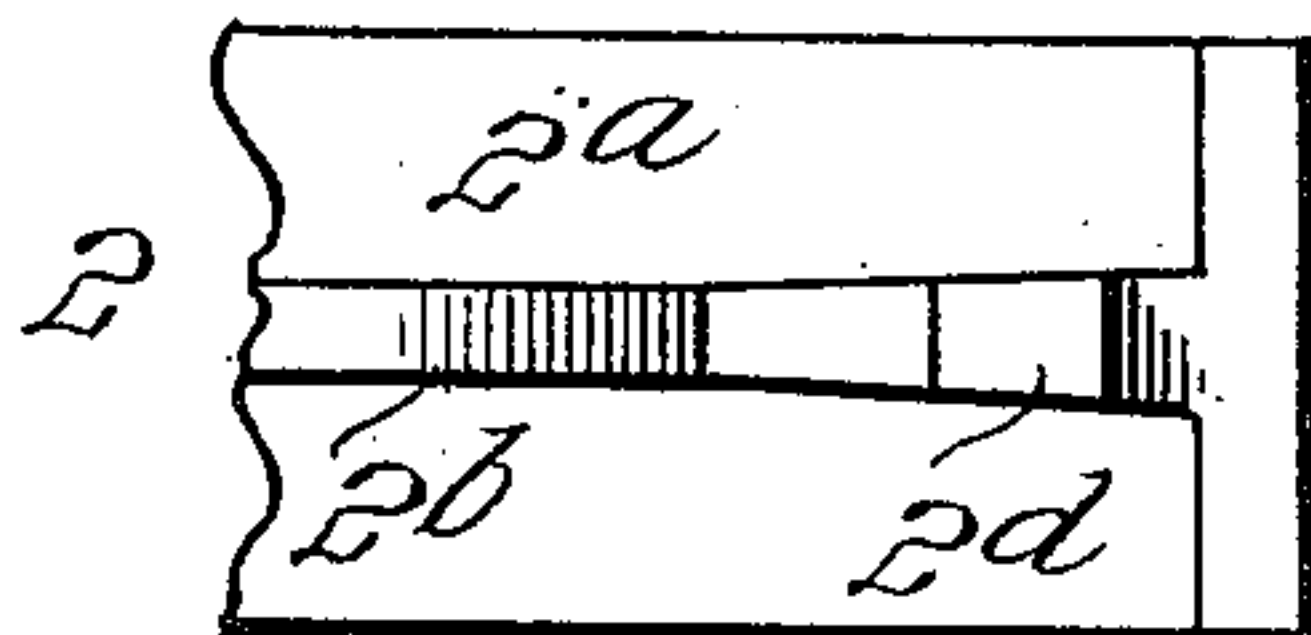


Fig. 11

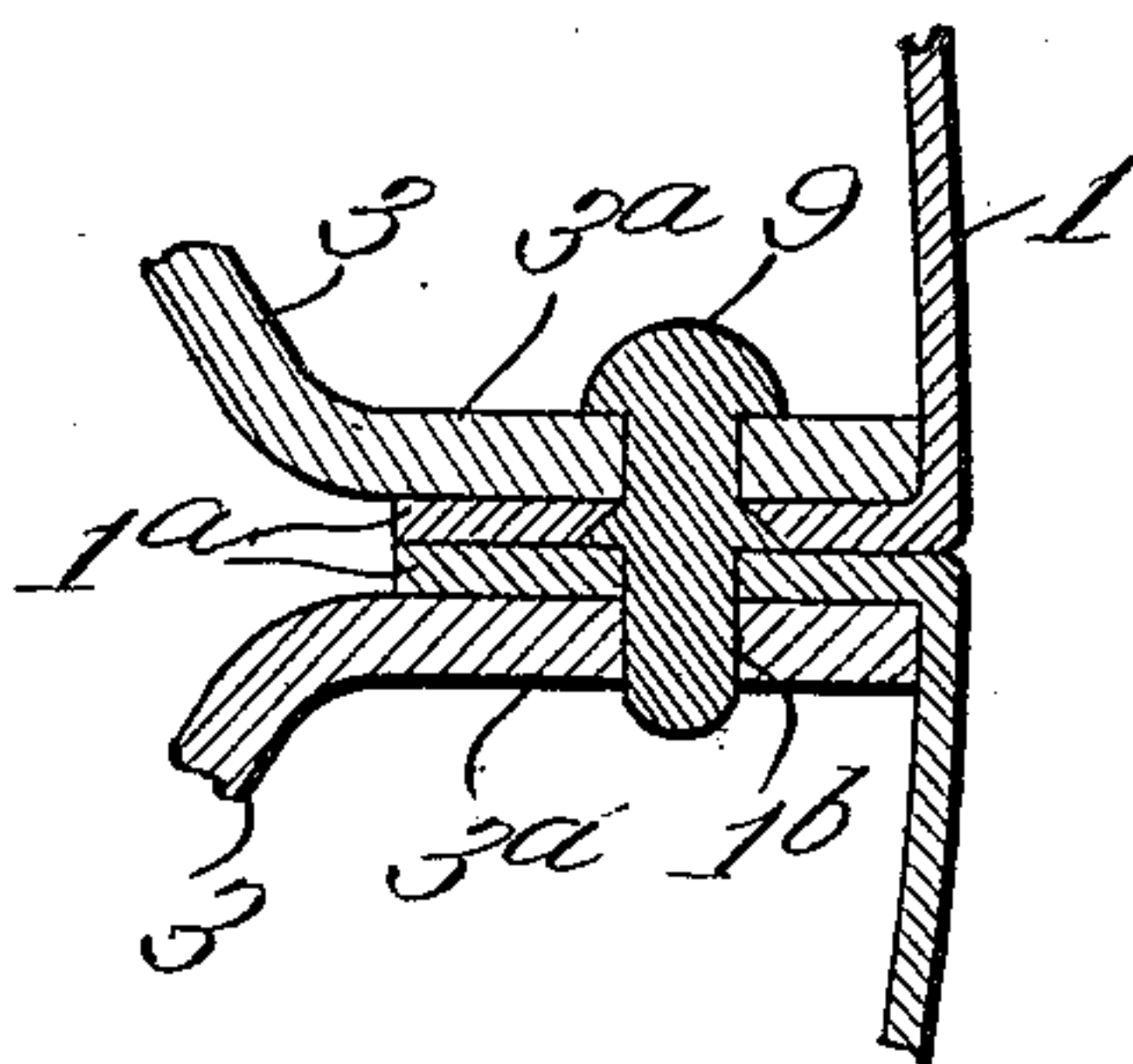


Fig. 12

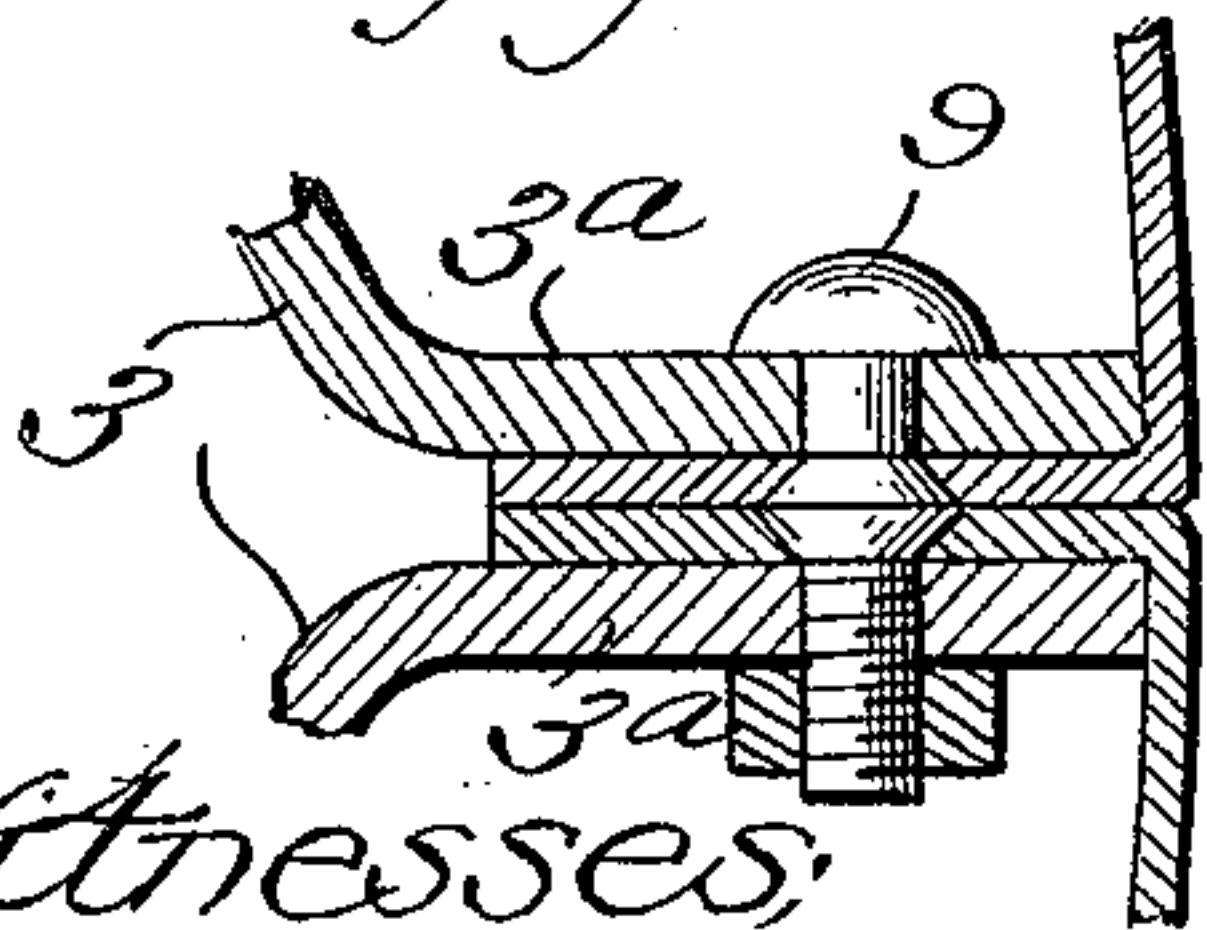


Fig. 13

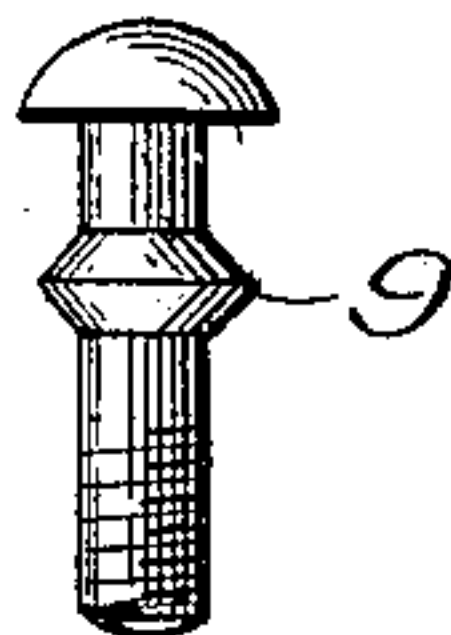
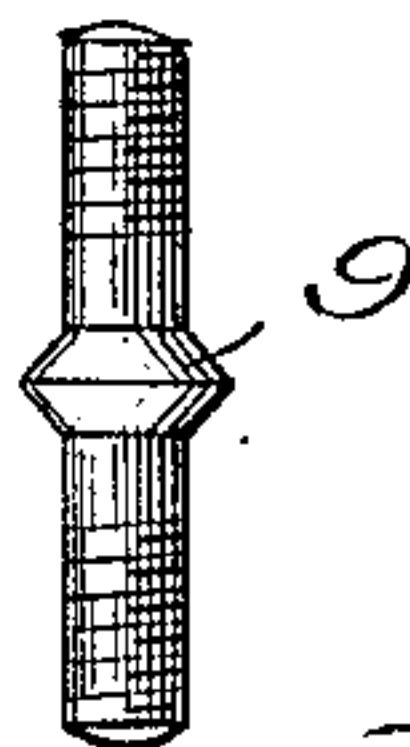


Fig. 14



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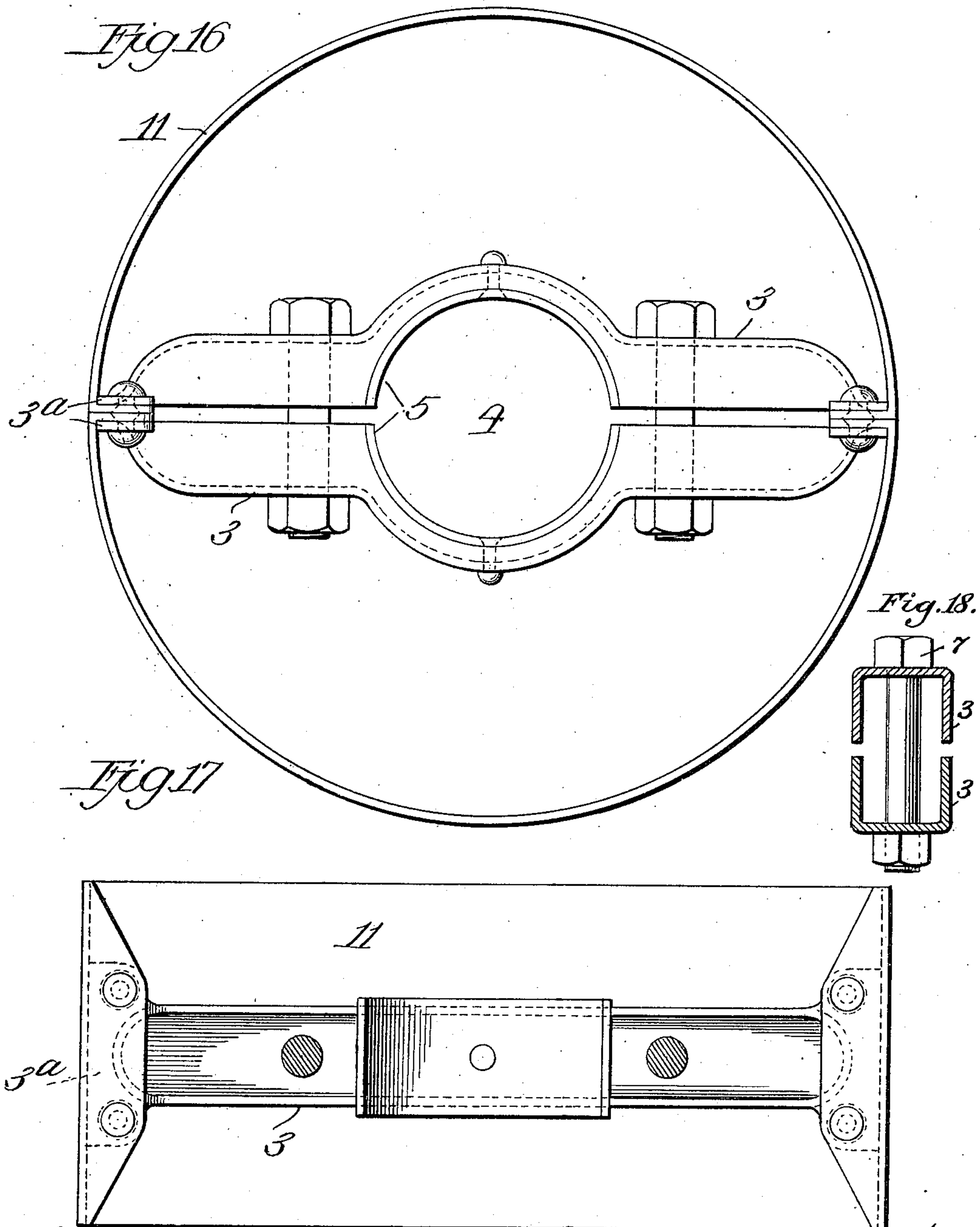
PULLEY.

APPLICATION FILED SEPT. 2, 1904.

Patented Aug. 1, 1911.

5 SHEETS—SHEET 5.

999,446.



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UNITED STATES PATENT OFFICE.

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PULLEY.

999,446.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed September 2, 1904. Serial No. 223,150.

To all whom it may concern:

Be it known that I, HENRY J. GILBERT, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Pulleys, of which the following is a specification.

My invention relates more specifically to pulleys constructed of sheet metal and of the split or sectional type, and the object thereof is to produce a simple and inexpensive pulley of this character and one which possesses the necessary elements of efficiency and durability in use. The various features of advantage and utility of my invention will be understood from the description hereinafter given.

In the drawings Figure 1 is a side elevation of a pulley embodying my invention; Fig. 2 is a top plan of one of the spoke arms shown by itself; Fig. 3 a bottom plan of such spoke arm; Fig. 4 a sectional plan of the pulley taken along the division line of the pulley showing the rim structure and lower spoke arm in elevation and the clamping bolts in section; Fig. 5 a sectional elevation on the irregular line 5—5 of Fig. 1 and illustrating a wide face pulley; Fig. 6 a view similar to Fig. 5 but illustrating a narrow face pulley; Fig. 7 a section on the line 7 of Fig. 4; Fig. 8 a sectional elevation on the line 8—8 of Fig. 7 and illustrating the end formation of the spoke arms; Figs. 9 and 10 detail views of the ends of the T-irons; Fig. 11 a central section of the spoke ends showing a means of fastening and alining the meeting ends of two pulley sections; Fig. 12 a view similar to Fig. 11 but illustrating a different form of fastener; Fig. 13 an elevation of the fastener of Fig. 12; Fig. 14 an elevation of a modified form of fastener; Fig. 15 an elevation of one of the meeting ends of the rim structure and the spoke arms illustrating a modified form of construction; Fig. 16 an elevation of a pulley illustrating a modified form of construction as to the rim structure; Fig. 17 a sectional plan of the pulley of Fig. 16 taken on the division line with all the parts in elevation except the clamping bolts, and Fig. 18 a cross-section of the spoke arms illustrating the substantially U-shaped form thereof.

My present invention relates more particularly to a rim and spoke end connection,

whereby the spokes or spoke arms are secured to or connected with the rim structure, which as illustrated in the drawings and as hereinafter referred to may partake of different forms. In the simplest form the rim structure or pulley face may be plain rim segments of sheet metal, with their meeting ends inturned or infolded, or such rim structure may be formed of T-irons formed to proper shape and with their flanges inturned or infolded, or the rim structure may comprise both inner rim segments and the T-irons, in which latter case the T-irons would constitute members for reinforcing the rim segments, and they would not have their flanges inturned or infolded.

The rim structure last described is the preferred one, but the other forms are also herein illustrated and described, inasmuch as my invention, when viewed in its broader aspect, is not to be limited to any particular form of rim structure. It will also be understood that my invention is equally applicable to what are commonly known as wide face and narrow face pulleys, and both of such forms are herein illustrated, and will be hereinafter described.

Referring first to the preferred form of pulley structure, which is illustrated more particularly in Figs. 1 to 5, the pulley is of the split or sectional type, each pulley section or half comprising a substantially semi-circular rim segment 1, a T-iron 2 formed to fit within its segment, and a spoke arm 3 extending substantially diametrically of the pulley structure but in fact extending slightly above but parallel with the division line of the pulley. The rim segments 1 forming the pulley face have their ends or flanges 1^a turned or folded inwardly radially of the pulley structure so as to lie on either side of the division line of the pulley. In the complete or assembled pulley the corresponding inturned ends of the pulley halves or sections bear against each other and are clamped together by the clamping bolts hereinafter referred to. The T-iron 2 of each pulley half or section constitutes a reinforcing member (in the form of pulley of Fig. 1), which member, together with its rim segment, is secured or connected with the ends of the spoke arms which are formed and arranged in the peculiar and novel manner hereinafter described. Each T-iron is

formed to the shape of a semi-circle and is composed of the web 2^a inwardly and radially directed, and the flange 2^b, which fits against the inner face of its rim segment and is secured in suitable manner, as by rivets 2^c. The meeting ends of the T-irons are provided with projections 2^a, which constitute a rivet after the T-iron and its spoke arm are assembled as hereinafter described.

The spoke arms are approximately U-shape in cross-section, and at their middle portion are outwardly curved to form a hub portion around a shaft bore or opening 4 to admit or receive the shaft on which the pulley is clamped, preferably through the medium of a split bushing 5. The two spoke arms of each pulley are held together and clamped upon a shaft by means of the inner and outer sets of clamping bolts 6 and 7. In the form of pulley illustrated in Figs. 1 to 5, that is the wide-face pulley, the hub portion is extended or expanded laterally, in which event two pairs of such inner clamping bolts are provided, one pair on each side of the hub portion, Fig. 4. The particular form of pulley illustrated in these figures is what is known as a wide-face pulley, in which the hub portion of the spoke structure should be strengthened, but my invention is equally applicable (as hereinafter made apparent) to a narrow-face pulley, as shown in Fig. 6, in which construction only two of such inner clamping bolts are employed, one on each side of the hub portion thereof.

The formation of the ends of the spoke arms, which constitutes the principal feature of my invention, is such that a most efficient and rigid connection is made with the T-iron and rim segments, when considering the form of Fig. 1, or with the rim segment only, or the T-iron only, when considering the other forms of pulleys respectively illustrated herein, it being understood that the rim structure, whether it be segments or T-irons, is so constructed and arranged as to cooperate with the spoke ends formed in the manner now to be described.

Still referring to the preferred form of pulley structure and particularly to Figs. 1 to 4, the spoke arms are approximately U-shape in cross section and arranged flange to flange, that is with their flanges directed inwardly toward each other and toward the division line of the pulley. The ends of each spoke arm are formed to a peculiar shape to enable the spoke arms to be advantageously connected with the rim structure. As shown, the central portions of the ends of the spoke arms are depressed or flattened outwardly, and the remainder or sides are flattened and extended laterally of the body of the spoke arms, with the result that these spoke ends are substantially flat plates 3^a, integral with the spoke body and lying

in substantially the same plane as the faces or edges of the flanges of the spoke arms. In other words, the spoke ends are forked and terminate in flat plates constituting the connecting medium, between the spoke arms and the rim structure. The forking of the spoke ends not only provides for the formation of this flat connecting plate but also serves to accommodate and receive the stem of the T-irons. These spoke ends are also parallel to the inturned flanges of the rim segments, and in the particular construction now being described these ends are connected or secured to such flanges. These parts may be held together in any suitable manner, as by the rivets 8, but in addition to such rivets I prefer to employ at each of the meeting ends of the pulley a fastener 9, which may be a combined rivet or bolt and a dowel pin, such as illustrated in Fig. 11, wherein one end of the fastener is shown as a rivet passing through a spoke end and the flange 1^a of a rim segment, while the other end, which is in effect a dowel pin, extends beyond the plane of the flange 1^a and across the division line of the pulley, whereby it may enter a hole 1^b in the flange 1^a of the other half of the pulley. By these means both halves or sections of the pulley may be brought and held in proper relative position. This fastener and aliner may partake of different forms, as for instance in Fig. 13 I have illustrated a modification in which the dowel portion of the first described fastener is formed as a bolt to receive a nut, and in Fig. 14 I have shown another form in which both ends of the fastener are screw-threaded to receive nuts. As hereinbefore suggested the ends of the T-irons have projections 2^a for the purpose of interlocking with the spoke ends. As illustrated in the drawings, more particularly in Figs. 2, 3 and 4, these spoke ends are provided with holes or slots 3^b, adapted to receive such porjections which extend therethrough and which by preference are riveted to the spoke ends at a point under the flanges 1^a of the rim segments.

In constructing or assembling the preferred form of pulley now being referred to, the T-irons are formed or shaped up as shown and described. Each spoke arm is set down over the projections of its T-iron, and such projections are then riveted; thereby fastening the T-irons solidly to its spoke arm. The rim is then placed around over the T-iron, and the ends folded in, thereby holding the T-iron and spoke arm firmly in place in the infold of the rim segment or section. The parts are now riveted and provided with the peculiar fasteners described. A complete pulley is formed from two of such sections or halves clamped together.

As herein stated, the rim structure may partake of different forms and in order to

afford a clear understanding of this fact and of the scope of my invention and claims I have illustrated some other forms of rim structure in the drawings, and will now
5 proceed to describe the same.

In Fig. 15 I have illustrated the pulley face rim structure as composed of T-irons 10, whose flanges are of the proper width in order to give sufficient pulley face. The
10 flanges of these T-irons are extended beyond the ends of the web or stem portions thereof, and such ends, marked 10^a, are intumed or infolded substantially radially of the pulley structure, and such intumed ends
15 are secured to the ends of the spokes in the same manner as such spoke ends were secured to the intumed ends or flanges of the rim segments according to the construction hereinbefore illustrated and described.

In Fig. 16 I have illustrated the other form of rim structure in which such rim is composed solely of rim segments 11, this construction being the same as that in Fig. 1, with the exception that the T-irons are
25 dispensed with. The construction of spoke arms illustrated in this figure of the drawings is the same as the spoke construction of the pulley in Fig. 1, inasmuch as its spoke arms are approximately U-shape in
30 cross-section and provided with end plates suitable for fastening with the rim segments.

I claim:—

1. A pulley formed of sheet metal and
35 comprising a rim structure, and parallel spoke arms arranged substantially diametrical of the pulley, said spoke arms having their ends depressed and flattened at their middle portion with sides rising above
40 such depressed portion, such ends being flattened so as to lie in planes parallel to the axis of rotation of the pulley, said flattened ends of the spoke arms being arranged to be connected with the rim structure;
45 substantially as described.

2. A pulley comprising a rim structure, and spoke arms approximately U-shaped in cross section and having their ends depressed centrally and extended laterally to
50 form straight flat portions lying in planes parallel to the axis of rotation and leaving the opposite sides of the spoke ends rising above the depressed portions, said ends being connected with the rim structure; sub-
55 stantially as described.

3. A split pulley having a rim structure made in halves and provided with intumed ends of flanges, and spoke arms approximately U-shape in cross-section and dis-
60 connected and separated along their length and also having their ends depressed centrally and also flattened to form straight flat portions lying in planes parallel to the axis of rotation, the opposite sides of the spoke
65 ends forming walls rising above the de-

pressed portions, said spoke ends being connected with the flanges of the rim structure; substantially as described.

4. A split pulley formed of sheet metal and having a rim structure made in halves
70 and provided with intumed ends or flanges, and spoke arms approximately U-shape in cross section, with their ends centrally depressed and also flattened and extended both outwardly and laterally of the spoke body,
75 the opposite sides of the spoke ends rising above said depressed portions, said spoke ends being connected with said flanges; substantially as described.

5. A pulley comprising a rim structure
80 and spoke arms approximately U-shape in cross section and having their ends depressed at their middle portions and extended, said ends being arranged to be secured to said rim structure; the opposite
85 sides of the spoke ends rising above said depressed portions, substantially as described.

6. A pulley comprising a rim structure and spoke arms having their ends forked and also flattened in planes parallel to the
90 axis of rotation, said spoke ends being connected with the rim structure; substantially as described.

7. A pulley comprising a rim structure and spoke arms approximately U-shape in
95 cross-section and having their ends forked and flattened in planes parallel to the axis of rotation, said spoke ends being connected with the rim structure; substantially as de-
100 scribed.

8. A pulley comprising rim segments having intumed flanges and spoke arms having their ends provided with forks terminating in flat plates, each of which lies in a plane
105 parallel to the axis of rotation and is secured to an intumed flange of a rim segment.

9. A pulley comprising a rim structure and spoke arms approximately U-shape in cross section and having their ends pro-
110 vided with forks terminating in flat plates which are extended laterally of the body of the spoke arms and lie in planes parallel to the axis of rotation, said plates being connected with the rim structure; substan-
115 tially as described.

10. A split pulley comprising rim segments, T-irons arranged therein, and spoke arms having their ends depressed centrally and substantially at right angles to their
120 length, said ends having on the sides of the depressions forked portions located above such depressed portions, said ends and depressed portions being connected with the segments; substantially as described.

11. A split pulley comprising rim seg-
125 ments, T-irons arranged therein, and spoke arms having their ends depressed centrally and substantially at right angles to their length, said ends having on the sides of the depressions forked portions located above
130

such depressed portions, said ends and depressed portions terminating in flat plates connected with the rim segments; substantially as described.

5 12. A pulley comprising rim segments, T-irons arranged therein, and spoke arms having their ends depressed substantially at right angles to the length of such spoke arms and provided with forked portions, the ends
10 of the spoke arms being connected with both the rim segments and the T-irons; substantially as described.

13. A pulley comprising rim segments, T-irons arranged therein, and spoke arms
15 having their ends forked and connected with the rim segments, the ends of the T-irons being connected with the spoke ends; substantially as described.

14. A pulley comprising rim segments, T-irons arranged therein, and spoke arms having their ends forked and terminating in plates secured to the rim segments, the ends of the T-irons having projections which are riveted to the spoke ends; substantially
25 as described.

15. A split pulley comprising rim segments with inturned meeting ends or flanges, T-irons arranged within the rim segments, and spoke arms arranged substantially diametrical of the pulley and having their ends flattened as to the entire width of the spoke arms and connected with said flanges, said spoke arms having their ends provided with forks at an angle to each other with webs or
35 depressed portions between them; substantially as described.

16. A pulley comprising a rim structure with inturned meeting ends or flanges, spoke arms connected with said flanges, and fasteners, one end of each fastener serving of
40 itself to secure the spoke end and a flange of one pulley section and the other end extending through the corresponding parts of the other pulley section; substantially as described.

17. A pulley comprising a rim structure with inturned meeting ends or flanges, spoke arms connected with said flanges, and fasteners, one end of each fastener serving of
50 itself to secure the spoke end and a flange of one pulley section and the other end constituting a dowel pin entering the corresponding parts of the other pulley section for centering the same; substantially as described.

18. A pulley comprising a rim structure with inturned meeting ends or flanges, spoke arms connected with said flanges, and fasteners, one end of each fastener serving of
60 itself to secure the spoke end and a flange of one pulley section by being riveted thereto and the other end extending into the corre-

sponding parts of the other pulley section; substantially as described.

19. A split pulley formed of sheet metal
65 and comprising rim segments with inturned meeting ends or flanges extending inwardly radially of the pulley, spoke arms arranged substantially diametrical of the pulley and having their ends centrally depressed and
70 flattened and connected with said flanges, said spoke ends also having forks at either side of the depressed portions, and T-irons arranged within the rim segments with the ends of their webs or stems bearing against
75 said flattened ends of the spoke arms; substantially as described.

20. A split pulley comprising rim segments with inturned meeting ends or flanges extending inwardly radially of the pulley,
80 spoke arms arranged substantially diametrical of the pulley and having their ends flattened and connected with said flanges, and T-irons arranged within the rim segments and having their ends interlocked with said
85 flattened ends of the spoke arms; substantially as described.

21. A split pulley comprising rim segments with inturned meeting ends of flanges extending inwardly radially of the pulley,
90 spoke arms arranged substantially diametrical of the pulley and having their ends flattened and connected with said flanges, and T-irons arranged within the rim segments and secured thereto, the ends of said T-irons
95 being arranged to bear against and interlock with said flattened ends of the spoke arms; substantially as described.

22. A pulley comprising a rim structure, and parallel spoke arms arranged substan-
100 tially diametrical of the pulley, said spoke arms having their ends depressed centrally toward their extreme ends and flattened so as to lie in planes parallel to the axis of rotation of the pulley and laterally extended be-
105 yond the plane of the hub portion of said spoke arms, said spoke ends being formed as forks arranged at an angle to each other and forming walls for the centrally depressed portions, said ends being connected with the
110 rim structure; substantially as described.

23. A split pulley comprising rim segments, T-irons arranged on the inner faces thereof, and spoke arms extending substan-
115 tially diametrically thereof, the ends of such spoke arms being centrally depressed toward the division line of the pulley and the remaining portions being extended laterally in the form of forks connected with the segments; substantially as described.

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