

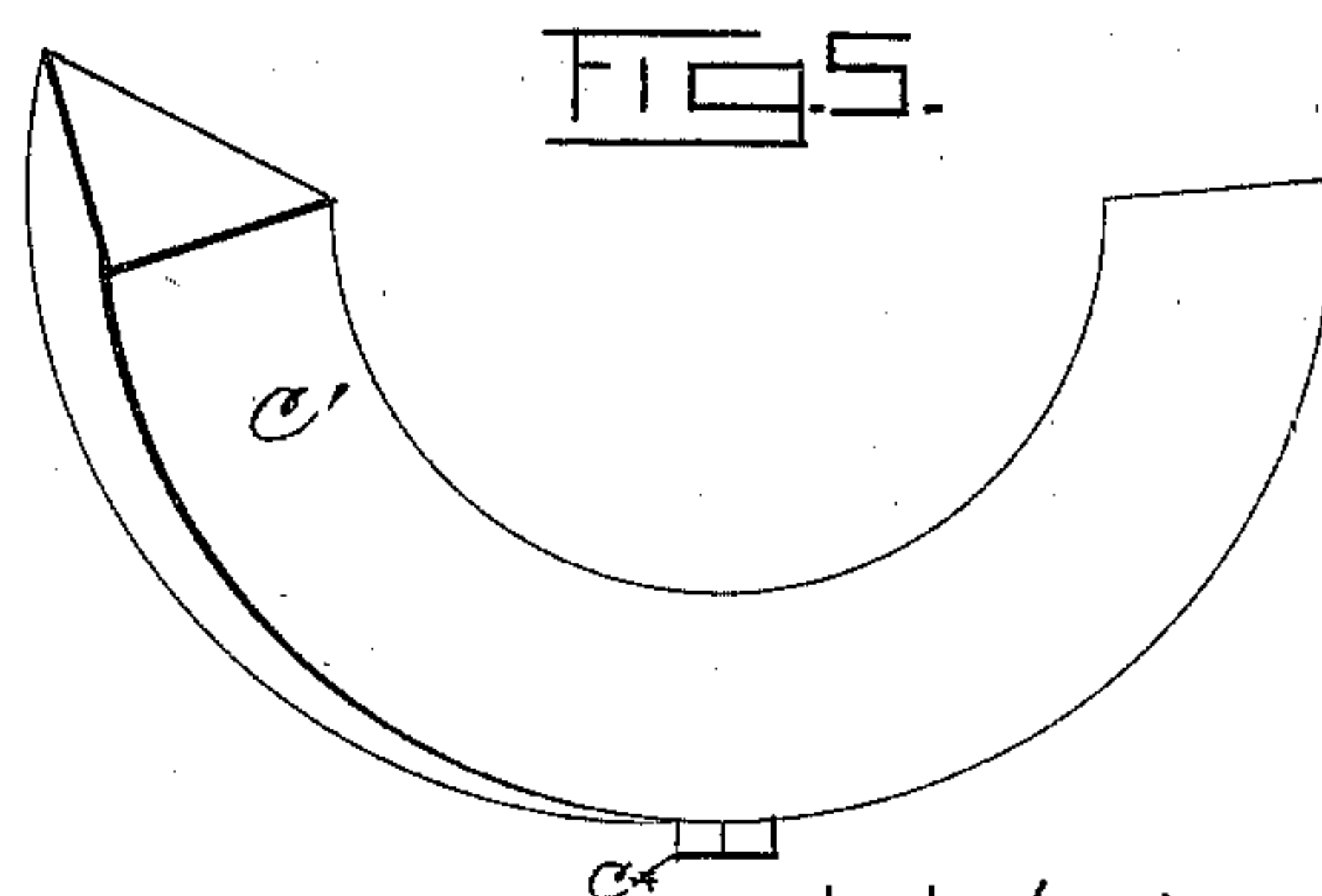
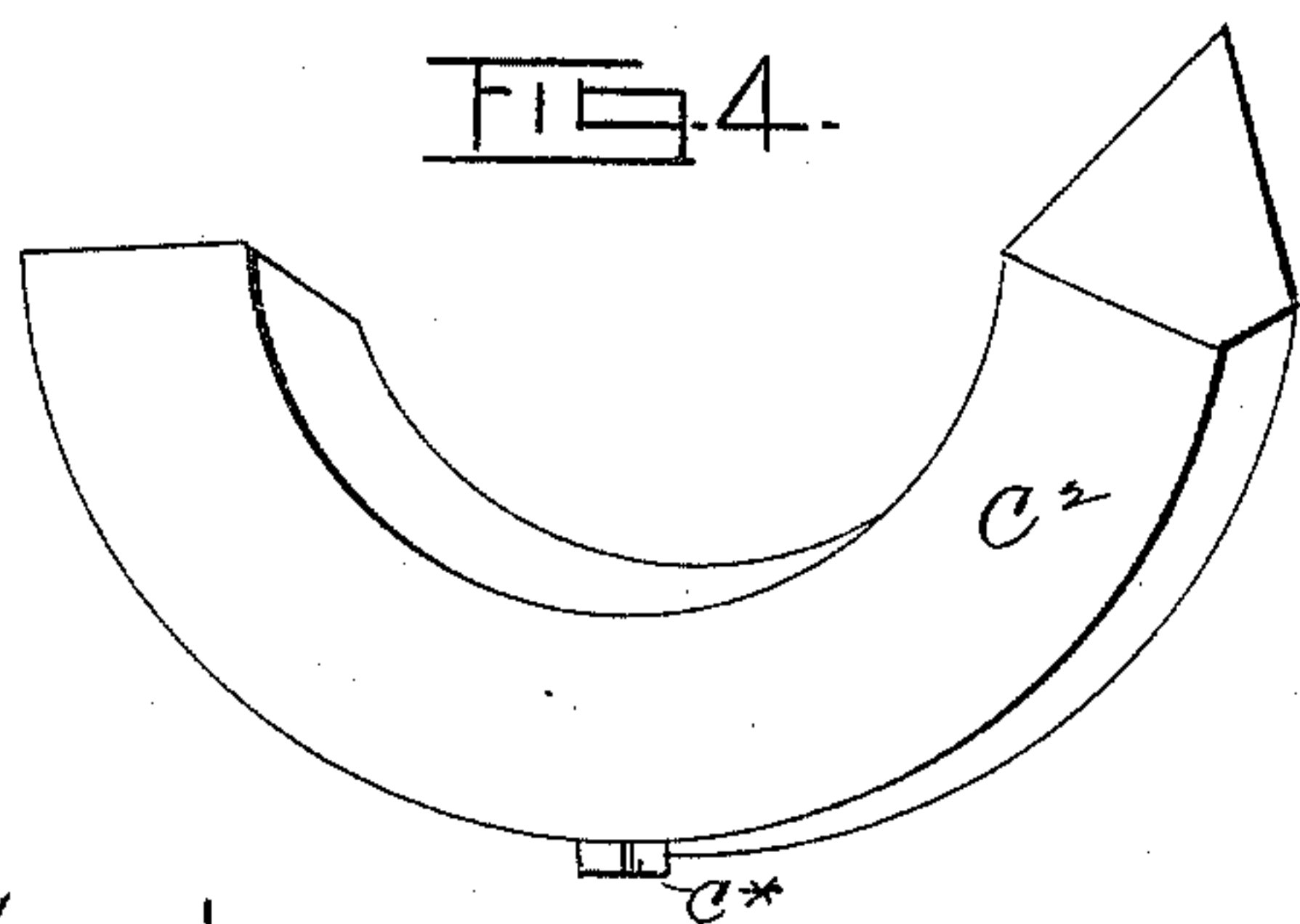
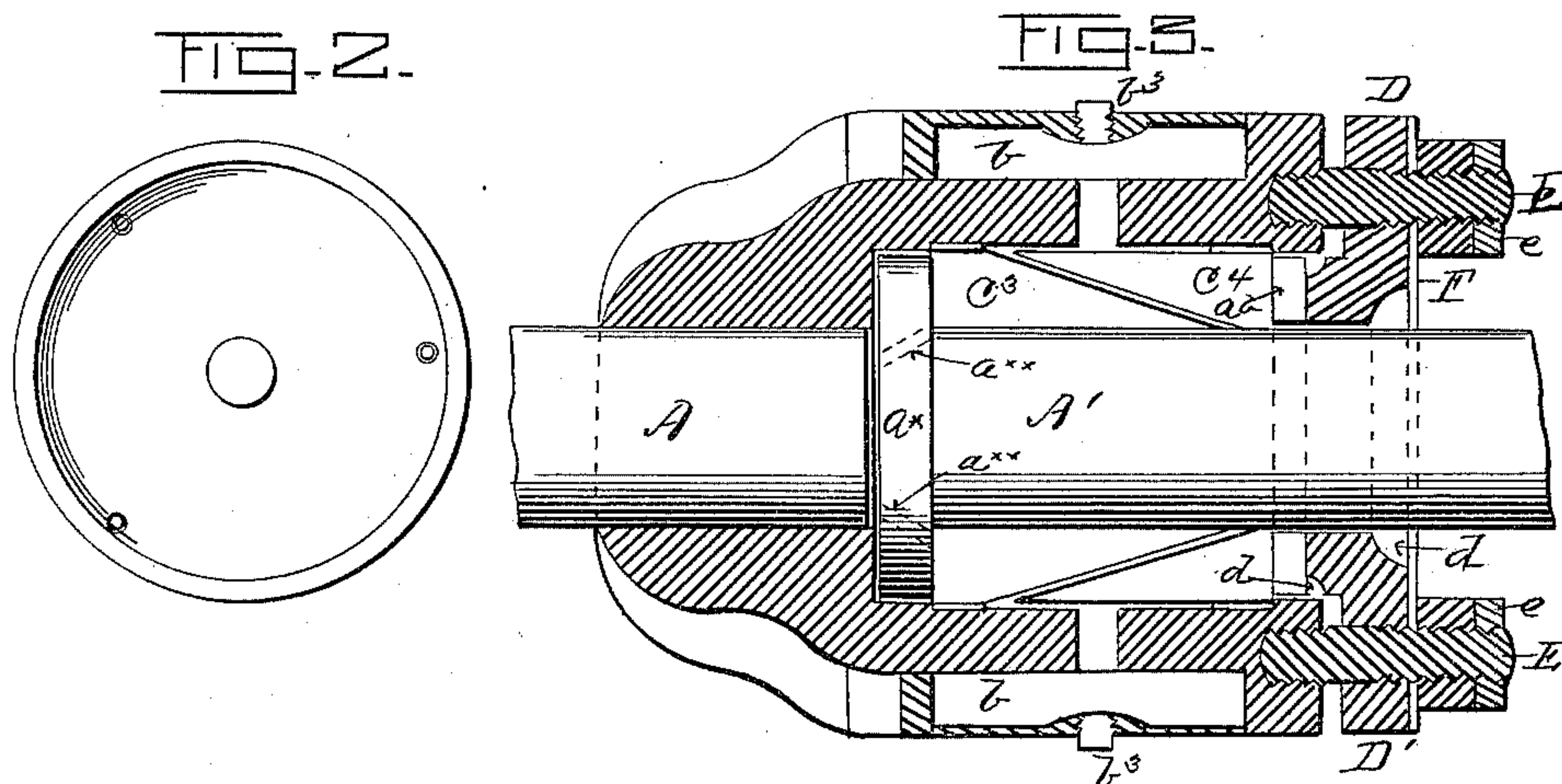
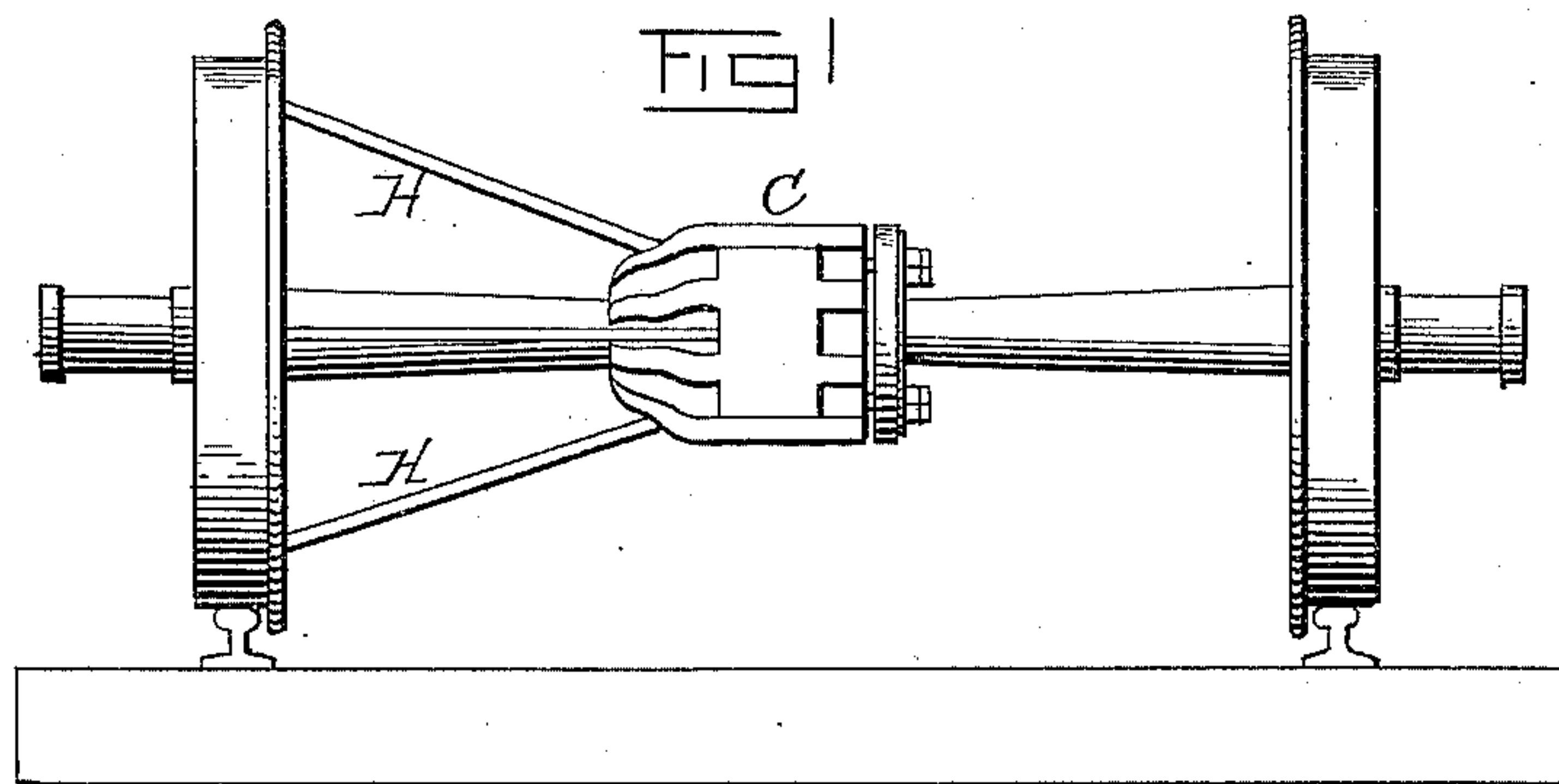
(No Model.)

2 Sheets—Sheet 1.

G. W. BEDBURY.
DIVIDED CAR AXLE.

No. 335,737.

Patented Feb. 9, 1886.



WITNESSES

Stovius A. Clark.

J. N. Kaul

INVENTOR:

George W Bodbury

(No Model.)

2 Sheets—Sheet 2.

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Fig. 8.

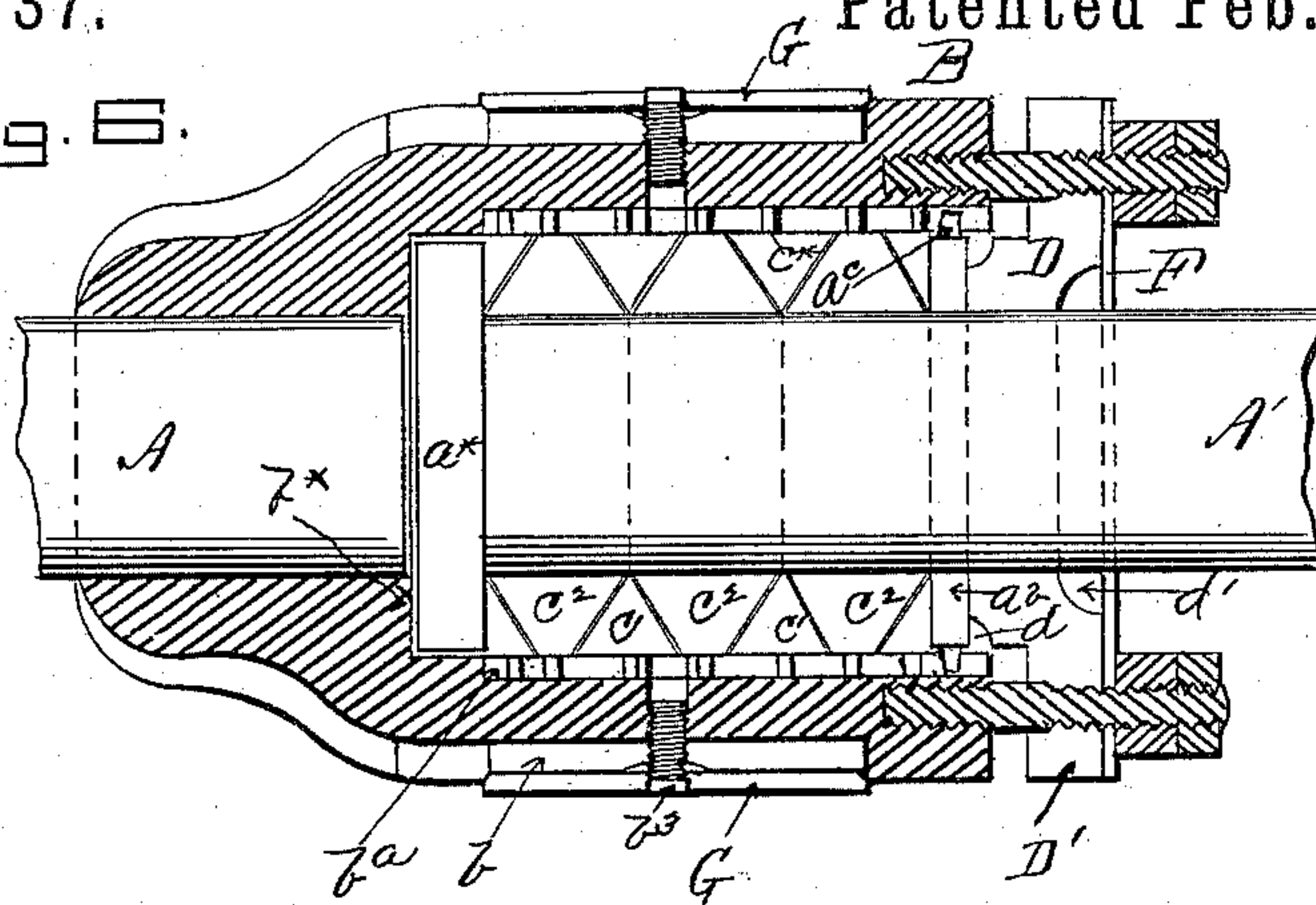


Fig-7-

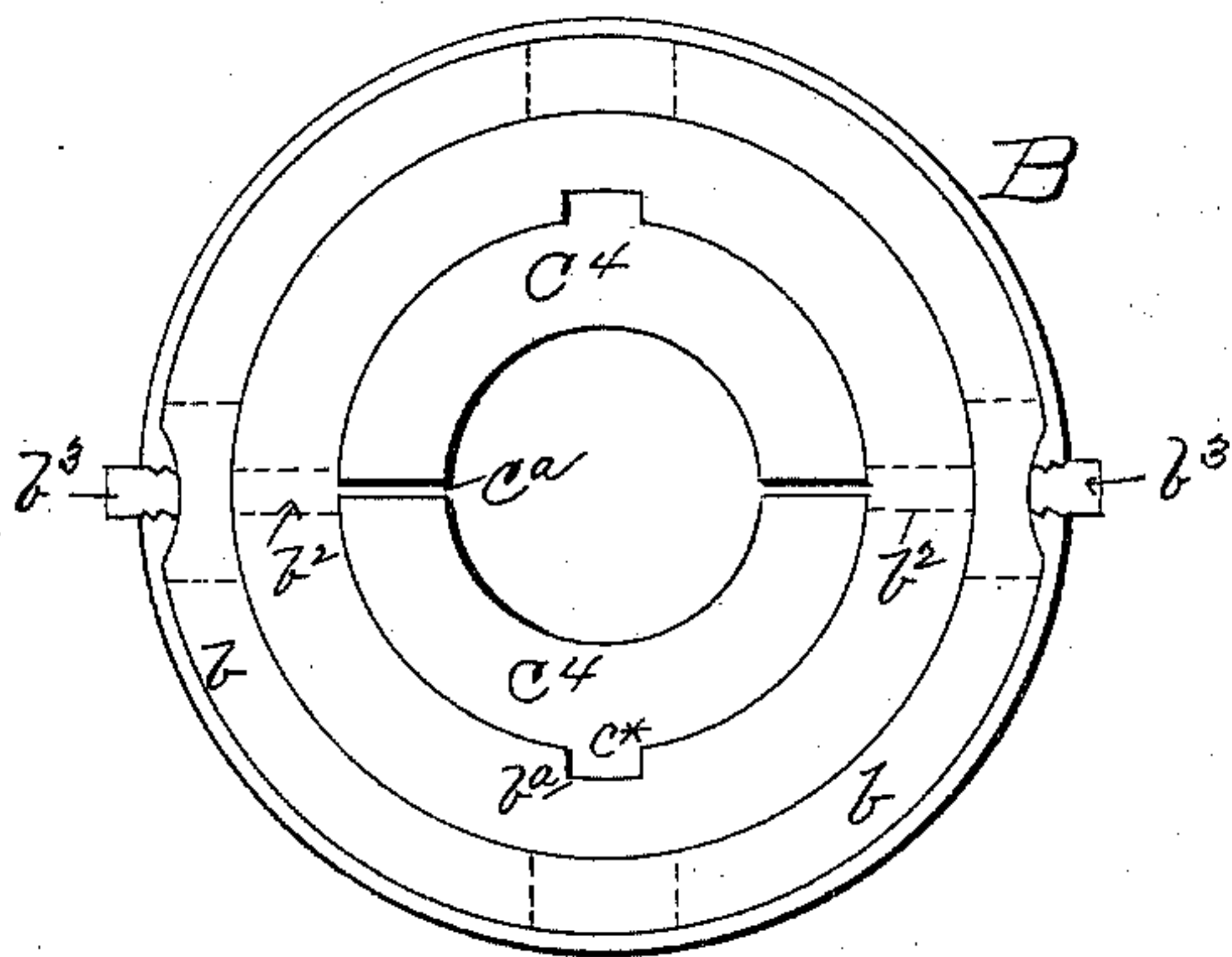
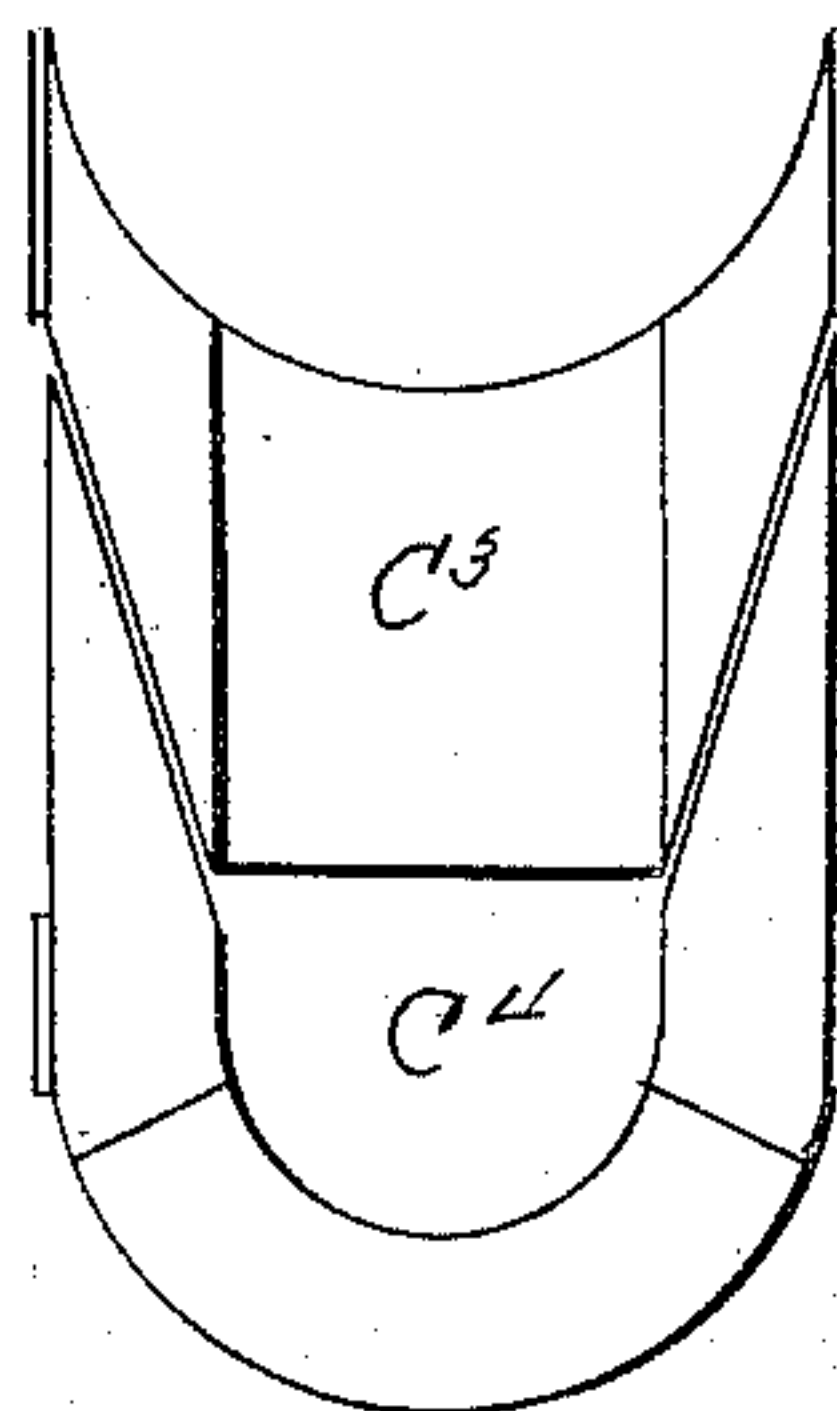


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE W. BEDBURY, OF SAN FRANCISCO, CAL., ASSIGNOR TO THE BEDBURY DIVIDED CAR AXLE COMPANY OF CALIFORNIA, OF SAME PLACE.

DIVIDED CAR-AXLE.

SPECIFICATION forming part of Letters Patent No. 335,737, dated February 9, 1886.

Application filed July 20, 1885. Serial No. 172,127. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BEDBURY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Divided Car-Axles; 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 letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to divided axles for railway-cars, and has for its object the provision of a simple, cheap, and effective device for this purpose.

My invention contemplates improvements in this class of devices whereby I am enabled to provide adjustable divided packing rings or sleeves for the joint, thus taking the wear off the coupling box or chamber; also, a means whereby the wear of said packing may be taken up without removing the cap of the box or otherwise disturbing the parts; also, a construction by which an automatic oil supply or feed is produced, and a means for refilling or supplying the oil-chamber without going under the car.

My construction also enables me to avoid the strain upon the center portion of the axle, which has been found to be very great and a very great obstacle to the success of divided car-axles, by having a double fulcrum or two bearing-points to receive the upward strain on the center of the axle.

My construction and arrangement of parts also provides effectually against the escape of oil and against the ingress of dust, thus causing a longer wear or life for the parts and less trouble while in use.

Many minor points of construction giving great advantages to my device will be explained fully hereinafter, and specifically pointed out in the claims.

The accompanying drawings illustrate what I consider the best means for carrying my invention into practice.

Figure 1 is an elevation of the divided axle. 50
Fig. 2 is a side view of the car-wheel. Fig. 3 is a section of the box with the sleeve portions or pieces of packing. Figs. 4 and 5 are details of another form of packing. Fig. 6 shows a section of the box with the form of 55
packing shown in Figs. 4 and 5. Fig. 7 is an end view of the box with the gland removed. Fig. 8 is a perspective view of the sleeve-packing shown in Fig. 3.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is one part of the axle, and A' is the other. B is the coupling box or chamber, which has an annular hollow space or receptacle in its 65
walls, as shown at *b*, to act as an oil or other lubricant reservoir. This coupling box or chamber is shrunk or otherwise fastened upon the inner end of part A of the axle, as will be clearly seen in Figs. 3 and 6. To render this 70
union of box B and axle A less liable to injury and severance, the bore of the box is of two different sizes, the smaller portion encircling the end of part A and leaving a shoulder, *b**, formed in the metal of the box. This shoul- 75
der gives an enlarged portion of the bore for the reception of the end of the other portion, A', of the axle, and will allow a space for the packing which I employ to surround the end of part A' and take the wear off the interior of 80
the box B.

The end of part of axle A' is provided with a ring or band, *a**, shrunk or otherwise fixed on it, which fits snugly in the bore of the box and forms one of the fulcrums or bearing- 85
points, which gives strength and reliability to this divided axle, and which will be more fully described hereinafter.

The enlarged portion of the bore in box B is provided with longitudinal cuts or depressions 90
b^a in the sides, whose purpose will be seen presently. A ring or band, *a^b*, sets snugly over the end of part A' of axle, but movable thereon, has projections or studs *a^c*, which fit in the cuts or depressions *b^a* and cause said band or 95
ring to turn with the box B. While the fixed ring *a** lies at the bottom or inner end of box B, when the parts are in place, the ring *a^b* will

lie near the outer or open end of the said box, and this ring a^b forms the second one of the two fulcra or bearing-points, which give strength to the divided axle.

5 It is well known that the pressure or strain upon the center of an axle of a railway-car is always upward, owing to the weight of the car resting thereupon outside of the wheels, and where there is one single collar or sleeve held
10 inside of the coupling-box this pressure will soon cause the same to become loose and give a movement to the axle in lateral directions, vertically or horizontally, which is fatal to its utility and dangerous to the train; but with
15 my double fulcra or bearing-points the liability to this is entirely overcome, and the upward strain is taken up in such a way as to make this divided axle equally as strong or stronger than a solid axle.

20 Between the rings a^* and a^b is placed the packing C, which is of such character as to allow of being compressed or tightened up longitudinally to take up the circumferential wear on the internal periphery of the packing
25 or upon the end of part A' of the axle, if any should occur upon it. To effect this purpose, I employ semicircles or half-rings of packing metal—such as Babbitt or any suitable soft, smooth-wearing metal—of V-shape in cross-
30 section, and formed alternately with the point of the V inside and outside, so that one set—those having the broad head of the V inside and the point outside—will form the wearing-
35 surface for the joint, while the other set—or those having the reverse position—shall act as wedges to keep the wearing-surface snug against the circumference of the axle. These half-rings are marked C' and C², respectively, C' designating those which have the point of
40 the V turned inward, and C² those in which said point is turned outward. These half-rings or divided circles have lugs or projections C* upon them, which lie in the cuts or ways b^a , and hold the packing fixed or stationary in the box B.

45 Instead of having this specific form of packing, I may employ one having a slightly modified form, with the same junction and effect. This is shown in Figs. 3 and 8, where C³ and
50 C⁴ designate semicircular wedge-shaped packing-pieces, with the thin edges of the wedges overlapping and bearing upon each other. In this construction one of the pieces, C³, forms the entire wearing-surface for the axle, and is
55 of course a true cylinder on the inside, while the wedge is formed upon the exterior; and the other part, C⁴, is preferably true or cylindrical on the exterior, and tapering or wedge-shaped on the interior, which fits over the
60 other part, C³, and, by being moved upon it longitudinally in the proper direction, causes it to hug the axle with just sufficient pressure to make it work properly. These parts C³ and C⁴ also have the spines or projections C* upon
65 them, which lie in the cuts or ways b^a , and serve the purpose already ascribed to the said projections when placed upon the V-ring C'

and C². Now, it will be apparent that with either of these forms of packing—that shown by the characters C' and C², or by C³ and C⁴—a
70 longitudinal compression will give a circumferential tightening or closer hug of the said packing upon the axle A'. I have provided means for producing this longitudinal compression from the exterior of the box B, which
75 means consists, essentially, of a gland, D, fitting over the part A' of the axle and into the mouth of the box B, and bolts E, secured upon the end of box B and passing through the
80 flange D' of the gland, with nuts e for tightening upon said bolts and forcing the gland into the mouth of the box. The inner face of the gland D bears against ring a^b , and the ring a^b bears upon the packing; hence it will be
85 seen that by tightening nuts e the packing will be compressed upon the axle without removal or disturbance of any of the parts.

Instead of having the bolts E, any other means for adjusting and tightening the gland may be employed. If the packing-rings
90 should become so much worn as to sink beyond the reach of the gland, additional rings can be inserted—V-rings in the V-packing, and plain rectangular rings in the wedge-packing C³ and C⁴. The inner exterior corner of
95 the gland is cut away, as shown at d , to receive a packing of eight parts tallow and two parts white lead, to saturate candle-wick to prevent the escape of oil or other lubricant; and the outer interior corner is cut
100 away, as shown at d' , to receive a similar packing, to seal the joint at this point and prevent the escape of oil, and at the same time to prevent the entrance of dust and grit. These packings at d and d' render the device
105 oil and dust tight and cause the necessity for renewal of oil to be very seldom, and totally remove the liability to the entrance of dust, thus rendering it unnecessary to clean the parts, and contributing much to the life and
110 endurance of both the metal packing and the axle. The packing at d is held between the gland D, the walls of the bore in box B, and the ring a^b . The packing at d' is held between the gland, the axle, and a plate or
115 plates, F, which fit snugly round the axle and are provided with openings to set over the bolt E, to be held by nuts e , and consequently moved with the gland.

In fitting the parts together care should be
120 taken to so adjust the length of the axle-sections A and A' as that the end of part A', with its ring or flange a^* , will not quite touch the end of part A and the shoulder in the bore of box B. By leaving a small space between these
125 ends a great amount of friction is avoided. Oil-holes, as shown at a^{**} , bored between flange or ring a^* and end of part A', connect this small space at end of axle-sections with the packing-chamber and permit the oil to
130 pass between them. Lubricant is admitted to the metal packing-chamber through openings b^2 from the reservoir b in the box B, as before described. These openings b^2 register with

the spaces between the ends or edges of the packing-pieces, which space is indicated by c^a . This construction also makes the lubricator chamber or reservoir automatic, and causes it to continue to supply lubricant until it is entirely emptied. This action is as follows: At each revolution of the axle the openings b^2 are brought once immediately underneath the same, while the lubricant in the chamber or reservoir at any height above said opening b^2 will cause the said lubricant to flow in through the opening b^2 and rise to a height on the inside of the box level with the lubricant-line in the reservoir. In this way the supply of lubricant will be continued until the reservoir is entirely emptied. The chamber b is continuous and affords a single annular chamber; hence all the lubricant in it will flow to the lowest point and act as above described. The reservoir b is refilled, when necessary, through openings in the outer shell of the box B, closed by screw-plugs b^3 ; or, if desired, said reservoir may be formed with removable caps or covers, as shown at G in Fig. 6, in which case the same will be held in place by the plugs b^3 , which extend through the reservoir b and engage the metal forming the inner shell of the box. Four filling-openings, all provided with screw-plugs, will be sufficient to answer for ready filling in whatever position the axle may be turned. I have devised a construction, however, for filling the reservoir from the side of the car. This is shown in Figs. 1 and 2, where metallic tubes H connect said reservoir with the web of the car-wheel and pass through it with screw-caps upon their ends, which may be removed and the lubricant introduced through said channels or tubes H to the reservoir b without getting under the car. Three or more of such tubes may be provided, as may be found necessary or convenient in filling the reservoir.

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

1. A divided car-axle having adjustable packing rings or sleeves divided, as described, and held circularly immovable, and means, substantially as described, for tightening or compressing them longitudinally, as set forth.

2. A divided car-axle having adjustable rings or sleeves divided, as described, and held circularly immovable, and a gland resting directly or indirectly upon the packing, and means, substantially as described, for adjusting said gland.

3. In a divided car-axle, the combination, with the coupling-box having the longitudinal slits or ways described, of the ring or

sleeve packing having the projections for lying in said ways.

4. In a divided car-axle, the combination, with the coupling-box and parts of the axle, of the solid hard-metal rings or bands described, and divided packing rings or sleeves held circularly immovable and lying between said hard-metal rings or bands, and means, substantially as described, for adjusting said packing longitudinally.

5. The combination, in a divided car-axle, of the divided V-shaped rings, each alternate ring being set in reverse direction, so that one set of said rings shall form the wearing-surface for the axle and the other the tightening-wedges, said rings being held circularly immovable, and means, substantially as described, for adjusting said packing longitudinally.

6. In a divided axle, the combination of the two parts of the axle, the coupling-box having the oil-reservoir, the semicircular packing rings or pieces, and an opening or openings connecting the oil-reservoir with the space or spaces between the ends of the packing rings or pieces.

7. In a divided car-axle, a coupling-box having a continuous annular lubricant-chamber surrounding the entire axle, and an opening or openings from said chamber into the packing-chamber, whereby said chamber is given an automatic feed, as set forth.

8. In a divided car-axle, the combination, with the coupling-box and parts of the axle, of the packing rings or pieces and the gland having the packing at d , as shown and set forth.

9. In a divided car-axle, the combination, with the two parts of the axle, the coupling-box, metallic packing, and gland, of the packing at d' and securing plate or plates F, substantially as set forth.

10. In a divided car-axle, the combination, with the coupling-box having the lubricator-chamber, of the channels or tubes for filling said chamber, passing out through the wheel of the car and having suitable covers thereon, as set forth.

11. In a divided car-axle, the combination, with the coupling-box having a packing-space around the axle in its gland or outer face, of a plate or plates, as described, for holding and compressing the packing in said space.

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

GEORGE W. BEDBURY.

Witnesses:

W. W. KNOTT,

I. N. KALB.