

(No Model.)

3 Sheets—Sheet 1.

F. F. LANDIS.
TRACTION WHEEL.

No. 286,312.

Patented Oct. 9, 1883.

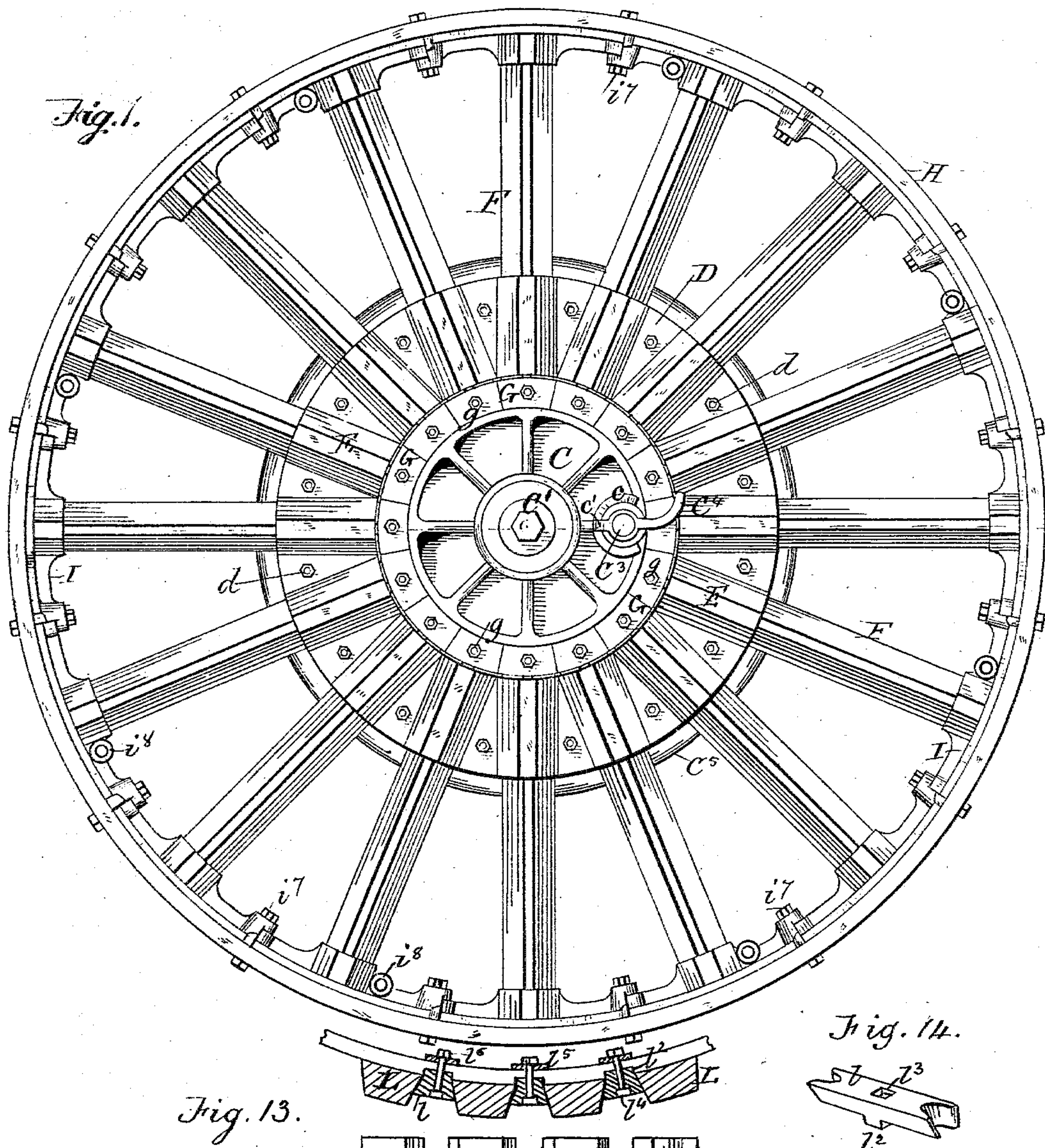


Fig. 13.

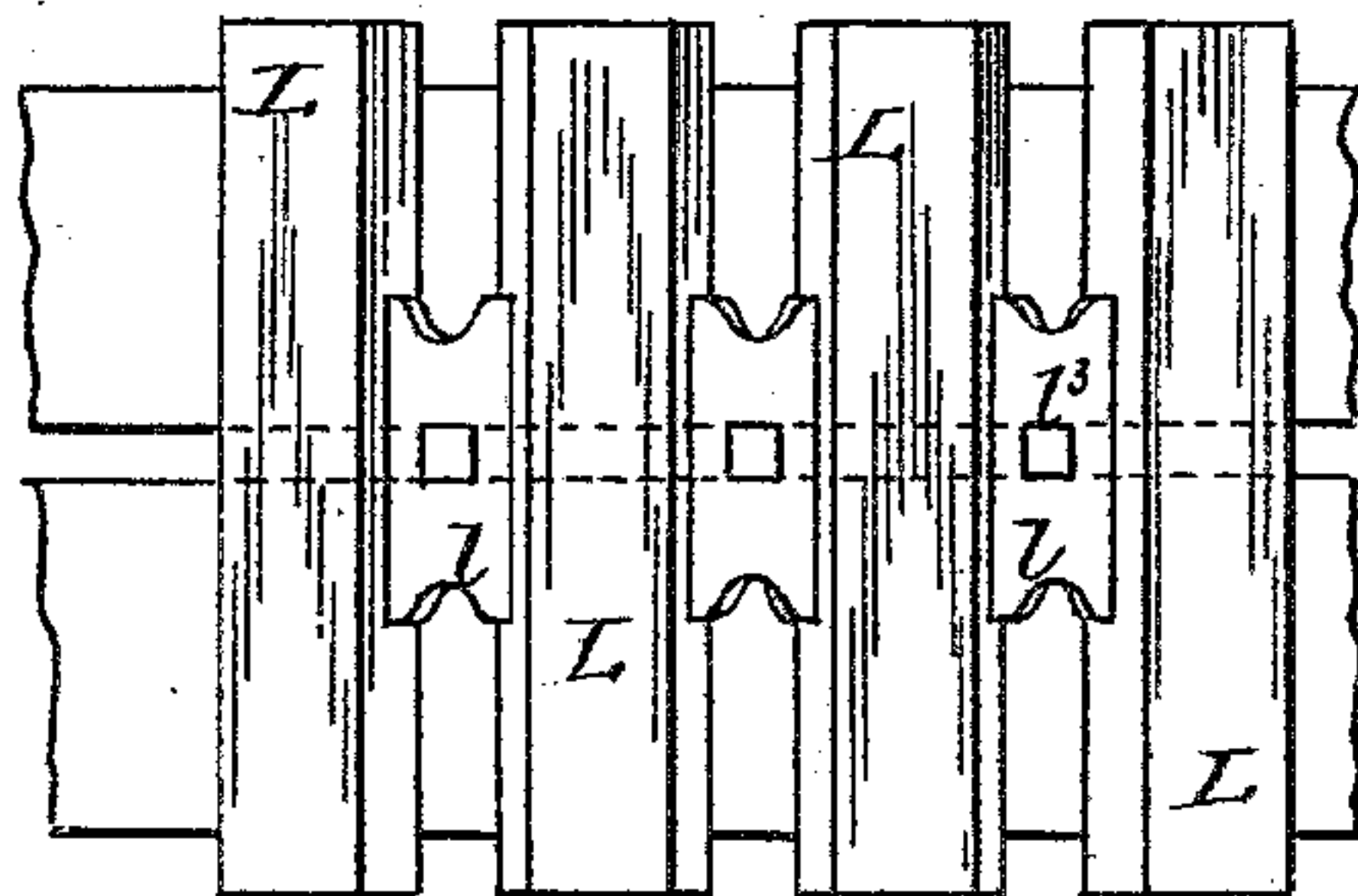
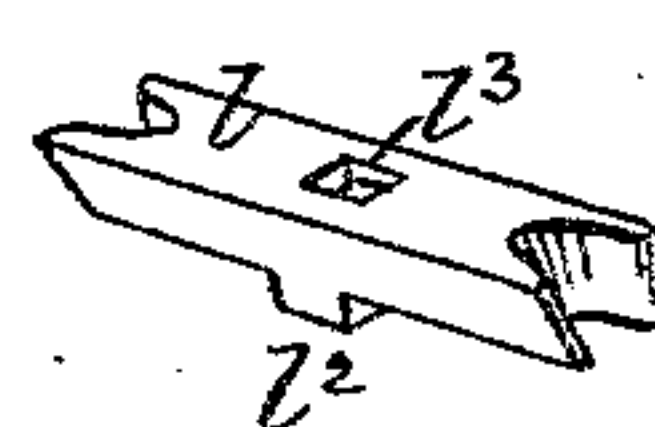


Fig. 14.



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Fig. 2.

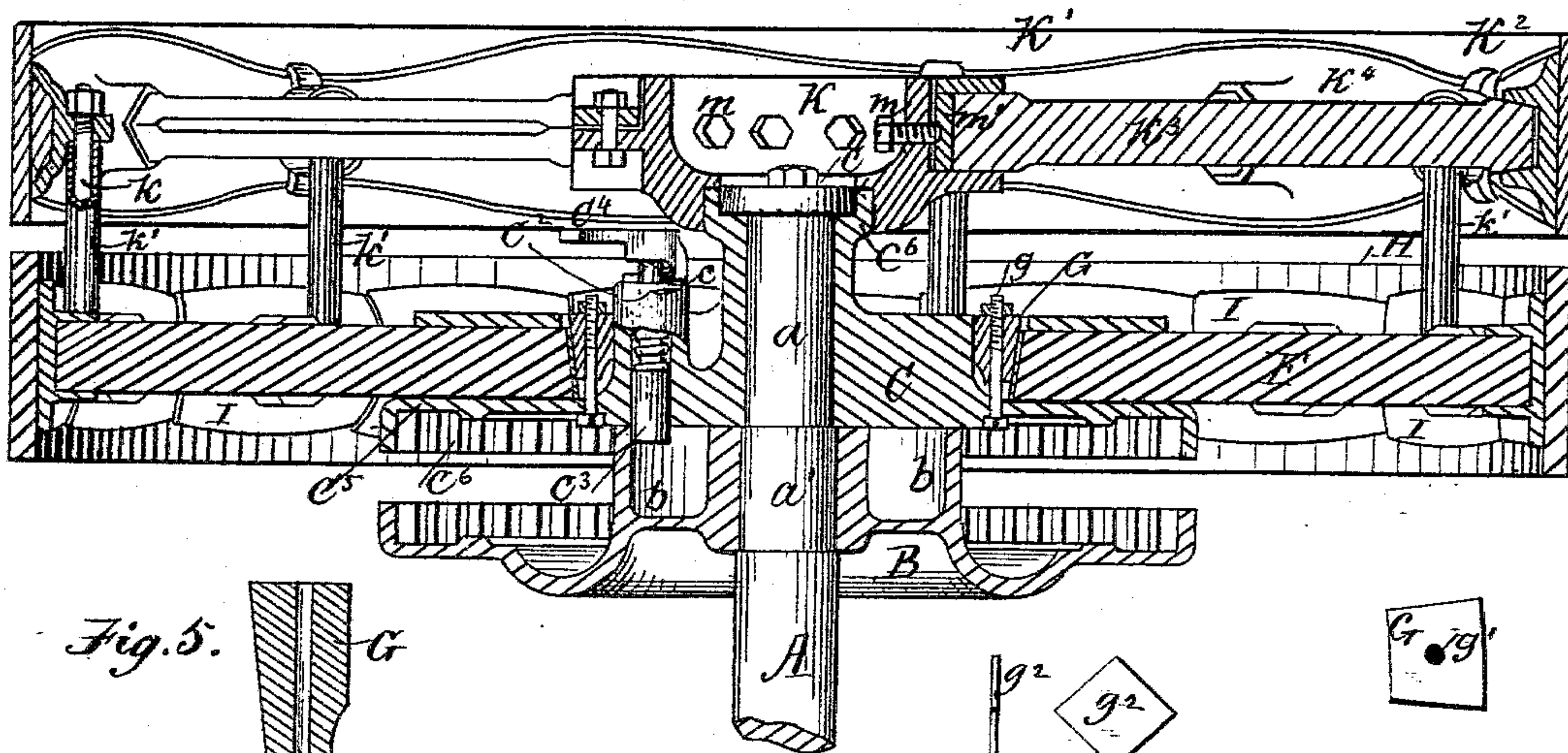


Fig. 5.

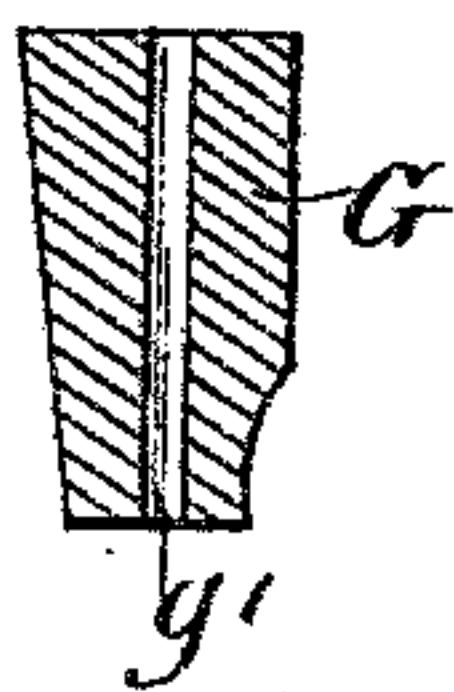


Fig. 7.



Fig. 6.



Fig. 3.

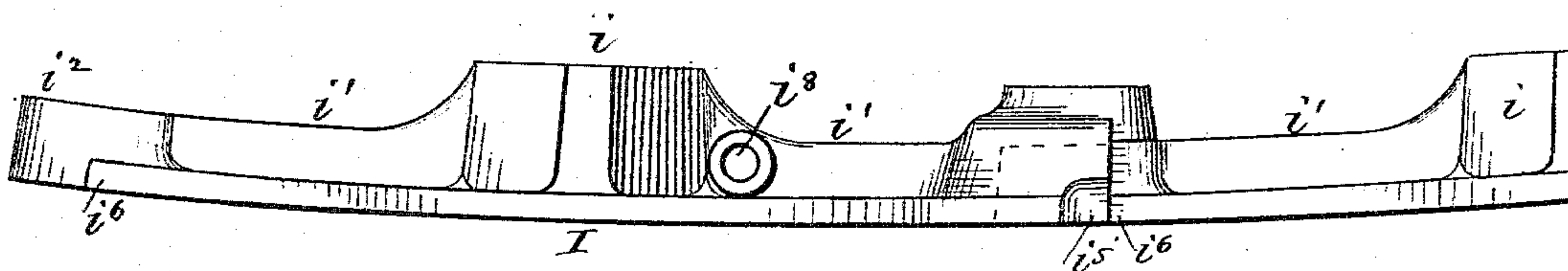
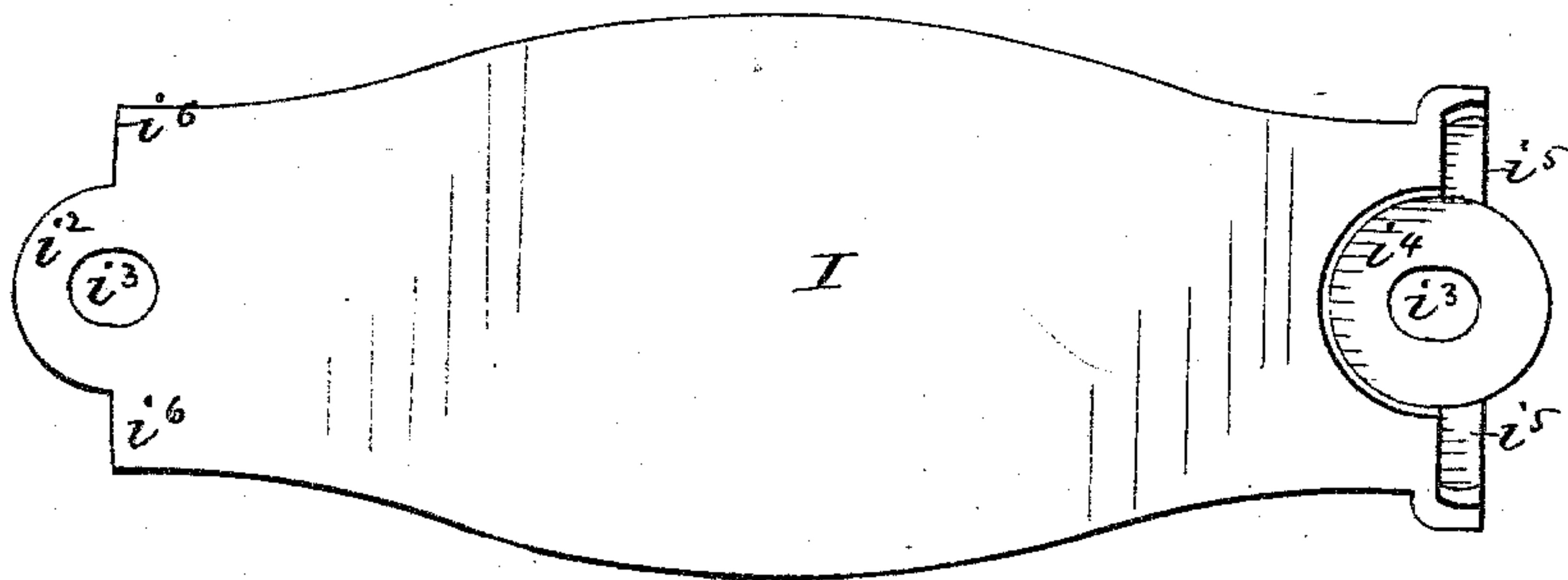


Fig. 4.



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Fig. 8.

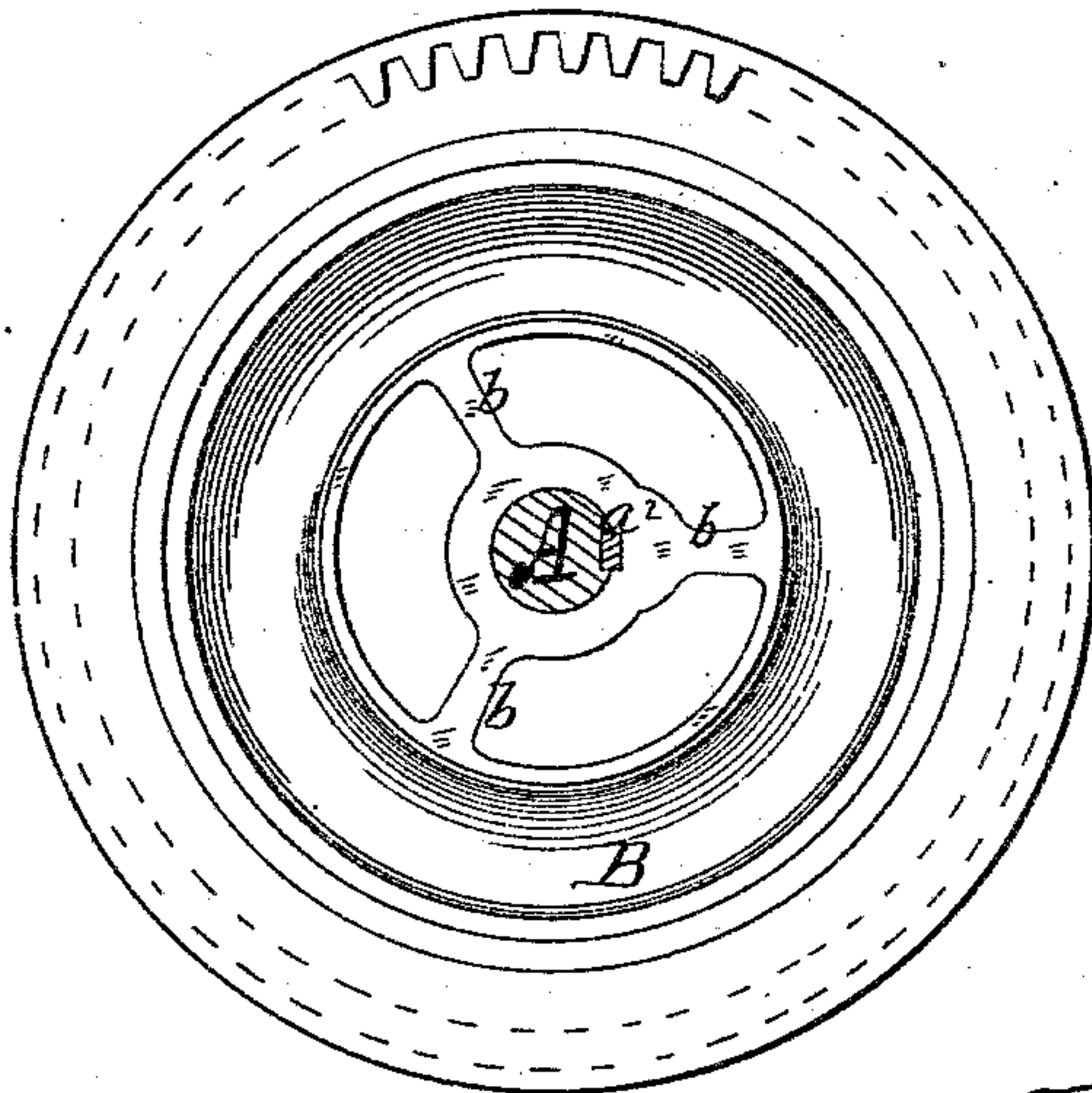


Fig. 9.

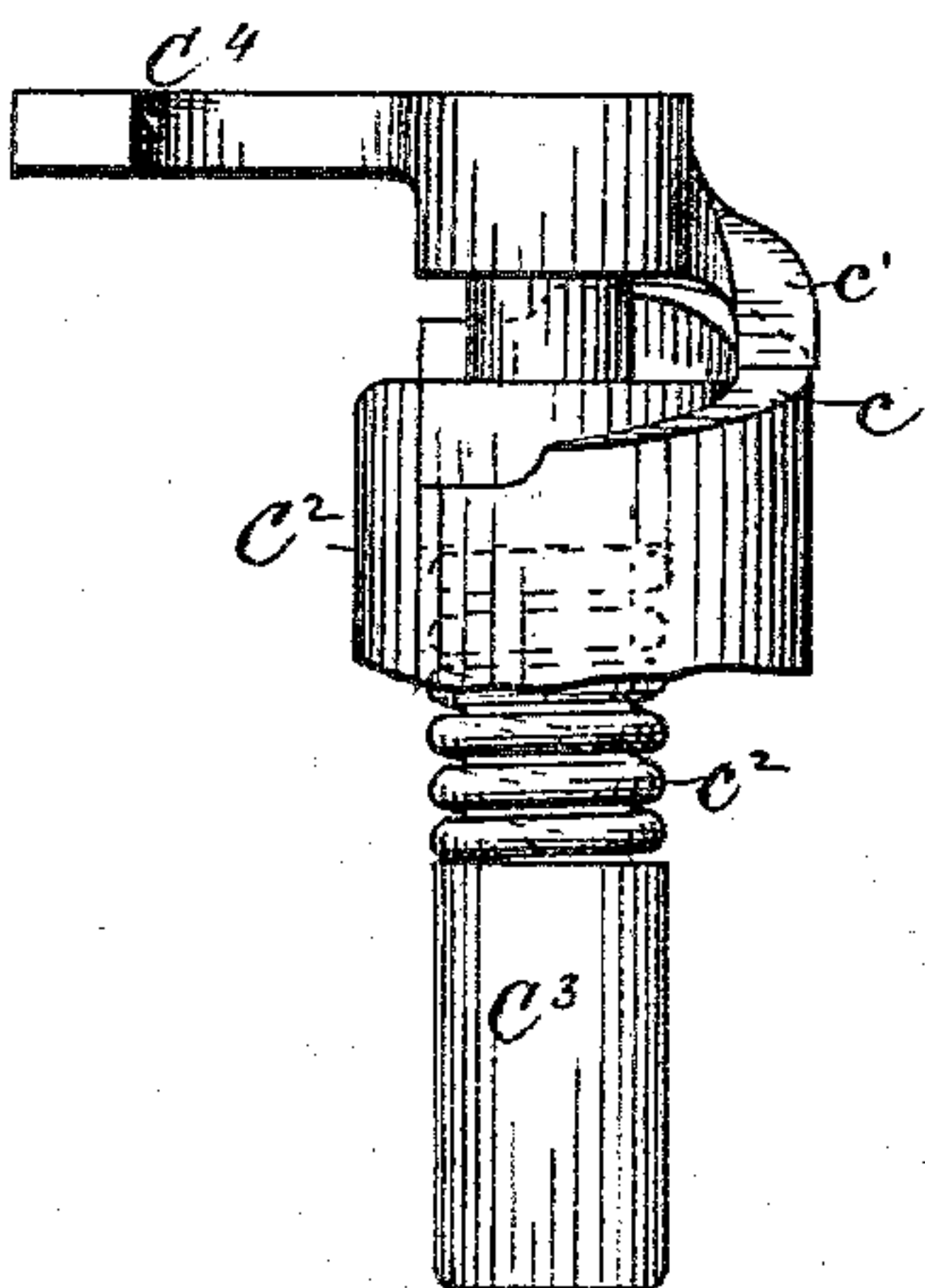


Fig. 12.

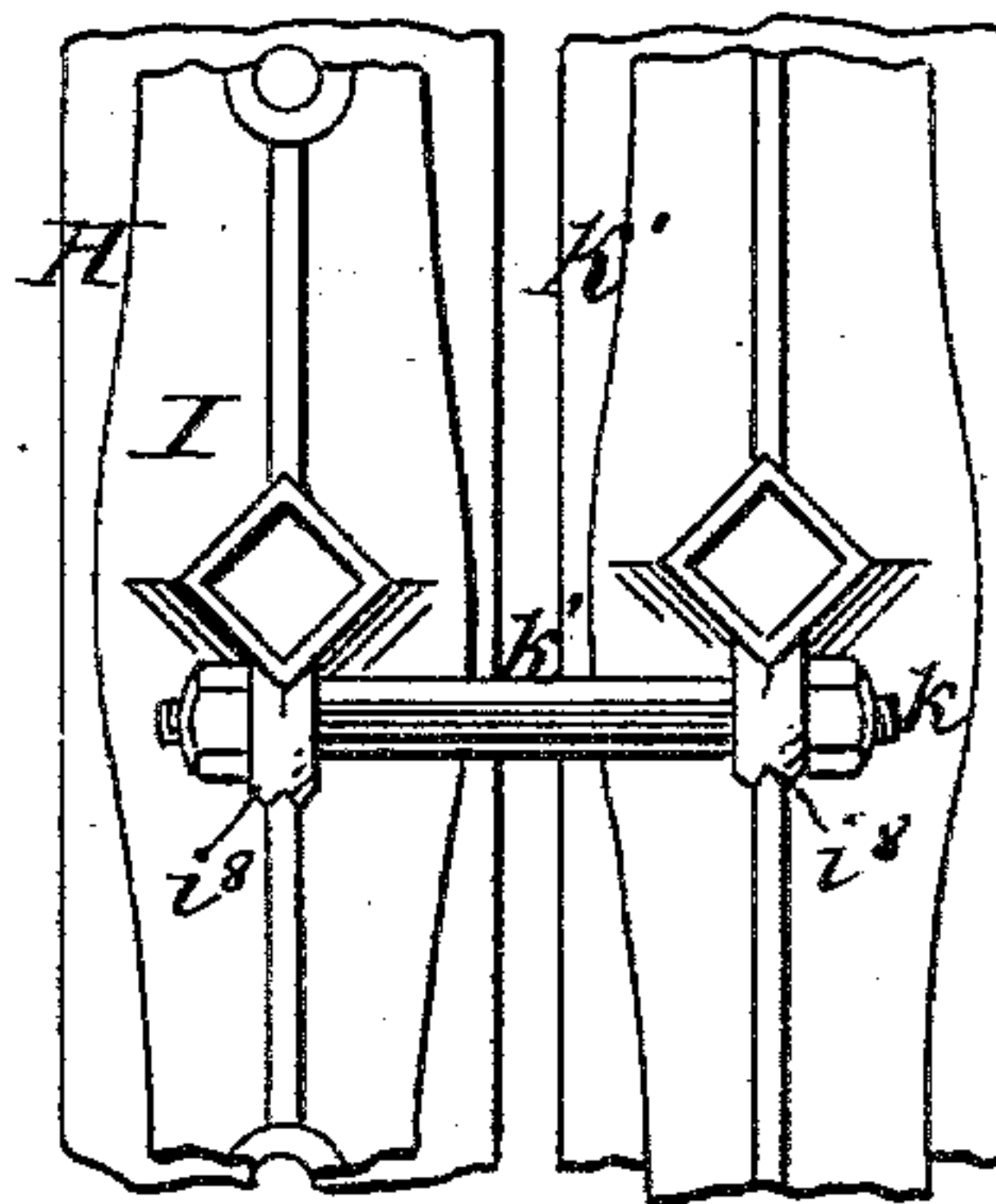
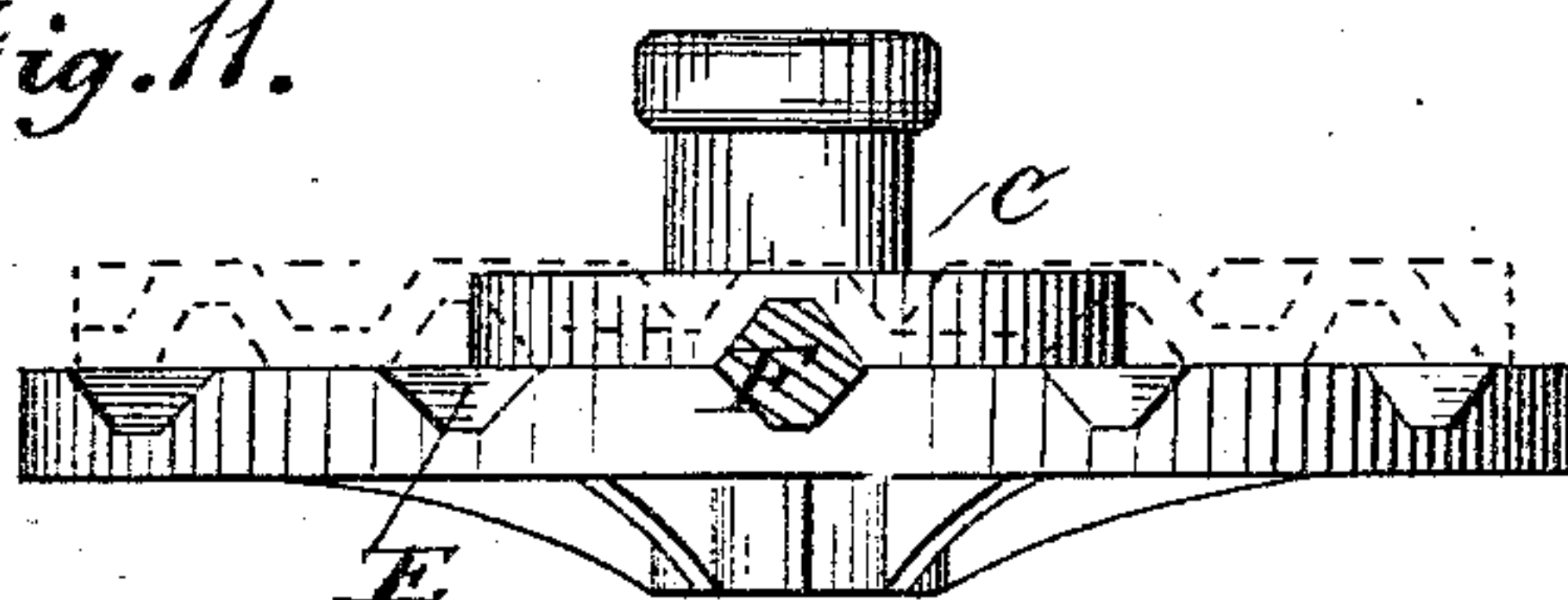


Fig. 10.



Fig. 11.



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UNITED STATES PATENT OFFICE

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

TRACTION-WHEEL.

SPECIFICATION forming part of Letters Patent No. 286,312, dated October 9, 1883.

Application filed July 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States of America, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Traction-Engine Wheels, of which the following is a specification.

My invention relates to certain improvements upon the wheel for which a patent has been heretofore granted me, being dated August 29, 1882, and numbered 263,342; and the objects are to provide a traction-wheel which shall possess unusual strength and facilities for removing, replacing, and adjusting the tension of separate and independent spokes; and my invention consists in the means employed to attain these and other advantages, as hereinafter more fully described, and specifically set forth in the claims.

Referring to the drawings, Figure 1 is a side elevation of a traction-wheel constructed in accordance with my invention. Fig. 2 is a central transverse section of the same and adjacent mechanism. Fig. 3 is an enlarged side elevation of the felly-sections; Fig. 4, a bottom view of one of said sections; and Figs. 5 to 14, inclusive, are details, hereinafter described.

Like letters indicate like parts in all the figures.

A represents the traction-axle, (see Fig. 2,) upon which are preferably formed two bearings, a and a' , and upon the latter is fixed by a key, a^2 , (see Fig. 8,) or it may be by any other well-known means, an internal gear, B, the hub of which is extended in the form of a spider, the arms b of which are in this instance three in number; but, if desired, they may be increased or diminished.

Upon the bearing a is fitted the hub C of the ground or traction wheel proper in such manner as to permit the revolution of the wheel thereon. A washer and bolt, C' , serve to retain the wheel upon the axle. The hub is provided with a boss or projection, C^2 , the outer end of which is shaped to form a cam or incline, c , extending partially around the boss. This boss is perforated in a line parallel with the bearing a , and in such a manner as to form a bearing for the larger portion of a key or pin, C^3 , and a bearing for the smaller portion thereof, which projects outwardly beyond the

boss, and is provided with a lever or handle, C^4 , the inner end, c' , of which is adapted to ride the cam c . A coil-spring, c^2 , encircles the smaller portion of the pin, and abuts against the shoulder formed at the junction of the smaller and larger portions of the pin and of the perforations of the boss, so that as the lever C^4 is rotated its end c' rides the incline and withdraws the pin in the hub C and out of the chambers between the arms b of the hub of gear B. In this manner the gear and traction-wheel are connected and disconnected, so that while the former is positively rotated with the shaft the latter may rotate independently thereon. Now, by inserting between the gear B and a gear formed on the traction-wheel, as hereinafter described, any usual compensating or driving gear motion may be positively or differentially communicated from one to the other; but such not being essential to my present invention, no further description is deemed necessary. The hub C is extended to form a flange, C^5 , provided with an internal gear, C^6 , above referred to. The flange C^5 is also constructed with depressions, arranged radially thereon, to serve, in connection with a ring, D, having similar radial depressions, as sockets E for the spokes F, the ring being secured against the flange by bolts d , located between the spoke-sockets. When the ring D is applied there is an annular space, the inner wall of which is the outer periphery of the main portion of the hub, and the outer wall of which is composed of the inner surface of the ring D, and of the depressions or half-sockets in said ring and in the flange C^5 . Within this annular space is arranged, opposite the inner ends of the spokes, a circular series of wedges, G, Figs. 1, 2, 5, and 6, which, by means of a bolt, g , passing through a perforation, g' , in each of the wedges and through the flange C^5 , are adapted to be independently drawn into said space and against the end of the spoke adjacent to each wedge, or, if preferred, against a diamond-shaped plate or washer, g^2 , (see Fig. 7,) resting against the end of the spoke. In the present instance the washer and spokes are substantially diamond-shaped in plan and cross-section, respectively; but other shapes may be employed, if desired.

H represents the tire of the wheel, which may be of any suitable material and construction.

tion. Against its inner surface is arranged a series of interlocking fellies, I, each comprising a longitudinally-central spoke-socket, i , a central strengthening-rib, i' , a rounded or convex projection, i'' , having an elongated bolt-hole, i''' , at one end, and at the other end a similar rounded projection and bolt-hole, but raised to form a concavity, i^4 , for the admission of the end of a second felly in the series, constructed like the opposite end, and as above described. Lateral recesses i^5 are formed adjacent to the recess i^4 , to receive the square corners i^6 , and adjacent projection i^2 . When a series of these fellies are arranged with the rounded projection and square corners inserted into the recess of an adjoining felly, a single bolt, i^7 , passing through the perforations i''' and through the tire firmly secures the parts together. This interlocking of the fellies produces a metal hoop of such strength as to be capable of traveling long distances over ordinary roads, even if the tire should break.

By making the bolt-holes elongated or oval, contraction and expansion and circumferential adjustment are provided for. If desired, rubber or paper-pulp cushioning may be provided at either or both ends of the spokes, which are preferably of wood, on account of the greater elasticity which it possesses.

By the construction described it will be seen that any one of the spokes may be removed or replaced, or its tension increased or diminished, without in the least affecting or disturbing any other spoke in the series, and that all of the spokes may be forced snugly against the tire or fellies.

It will also be seen that the independent wedges may be employed without the fellies herein shown and described, and that the fellies may be employed without the wedging mechanism, and that the flange and ring may be employed in other than a traction-wheel. I do not therefore wish to limit myself to these improvements when embodied in the traction-wheel, but should deem their use in other wheels as embraced in my invention.

As it is desirable that a traction-engine should be able to travel at times upon hard roads, and at other times upon soft, yielding ground, as in plowing, I have constructed my traction-wheel with this object in view, as follows: When the engine is to run upon hard roads, narrow-tire wheels, as shown at H, are used; but when it is to travel upon soft or sandy ground, and it is desired to increase the surface of the wheel, I fit snugly and securely upon the end C⁶ of the hub C the hub K of a supplementary wheel, K', having the same diameter as the main wheel, and a tire, K², of substantially the same width as the tire H, but otherwise made lighter than the main wheel, as it possesses only half the number of spokes K³ and fellies K⁴. The tire K² of this light wheel is kept securely at a uniform distance from the tire H of the main wheel by means of bolts k passing at one end through sockets i^8 in the fellies I of the main wheel and in the fellies K⁴ of the additional

wheel, as shown in Figs. 2 and 12, and upon the bolts k are placed tubular sleeves k' , to maintain the main wheel and additional wheel at a proper distance from each other. To increase the adhesion of these wheels upon yielding ground, there is placed upon their tires a series of wood laggings, L, of such length as to extend across and slightly beyond the edge of the metal tires. These laggings are about two inches thick, and have their outer face narrower than their inner face, (the latter resting upon the metal tires,) and are kept apart by metal cleats l , Figs. 13 and 14, having their outer face broader than their inner one. They are placed against the central portion of the laggings, and are provided with a central lug, l^2 , to enter between the metal tires of the wheels and help to steady them together. These cleats and lugs are bored centrally at l^3 , and receive a bolt, l^4 , long enough to pass through a washer, l^5 , bearing against the inside of the metal tires, and receive a nut, l^6 , by which the cleats and laggings are rigidly secured upon the tire of both wheels. To make the wheel K' as light as possible the wedges G, used to tighten the spokes of the main wheel, are dispensed with in said wheel K', and bolts m are screwed radially into the hub K and bear upon plates m' , resting against the inner ends of the spokes.

In place of using the bolt k to keep the wheels united, flat bars with small bolts inserted radially into the fellies and metal tires may be used for the same purpose; but I prefer the means fully shown and described.

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

1. In a traction-wheel, a hub provided with a flange having depressions forming half-sockets for spokes, and a ring having also half-sockets, and adapted to be secured to said flange, in combination with a series of independent perforated wedges arranged opposite the inner ends of the spokes, and means for forcing said independent wedges singly against the hub and spokes, substantially as shown and described.

2. A series of metal fellies, each provided at one end with a perforated convex projection, and a recess thereunder adapted to receive the opposite end of an adjacent felly, substantially as and for the purpose described.

3. A series of metal fellies, each provided with a recess adapted to receive the opposite end of an adjacent felly, and with perforations arranged to register one above the other, whereby a single bolt passes through both fellies, substantially as shown and described.

4. A felly consisting of a single casting provided with a central spoke-socket and a rounded projection at each end, the projection at one end being elevated above the plane at the opposite end and forming a recess within the felly end, substantially as and for the purpose set forth.

5. The combination of the axle A, provided

with the fixed internal gear, B, having a hub divided into chambers by ribs *b*, and a traction-wheel provided with the interlocking pin *C*³, and means, substantially as shown and described, for inserting and withdrawing said pin.

6. The combination of the hub C, spokes F, washers *g*², independent perforated wedges G, and bolts *g*, substantially as and for the purpose described.

7. The combination of the tire H, and a series of interlocked fellies having perforations at each end, registering one above the other, with bolts passing through one end perforation of two fellies and through said tire, substantially as and for the purpose described.

8. The combination of the hub C, perforated wedges G, ring D, washers *g*², spokes F, and interlocked fellies I, substantially as and for the purpose described.

9. The combination of the main wheel having hub C⁵, the supplementary wheel K', having the hub K, fitting upon the hub C⁶, horizontally-perforated lugs upon the fellies of said

wheels, bolts *k*, and sleeves *k'*, substantially as and for the purpose described.

10. The combination of the main wheel, the supplementary wheel having a hub made to fit upon the hub of the main wheel, means, as described, for uniting said wheels, laggings L, and cleats *l*, having central lug, *l'*, substantially as and for the purpose described.

11. The combination of the main wheel, the hub of the supplementary wheel fitting upon the hub of the former, the spokes K³, plates *m'* at the inner ends thereof, and radial bolts *m*, having their heads within the cavity of the hub K, substantially as and for the purpose described.

In testimony whereof I affix my signature, in presence of two witnesses, this 14th day of March, 1883.

FRANK F. LANDIS.

Witnesses:

D. M. GOOD, Jr.,
C. E. BESON.