

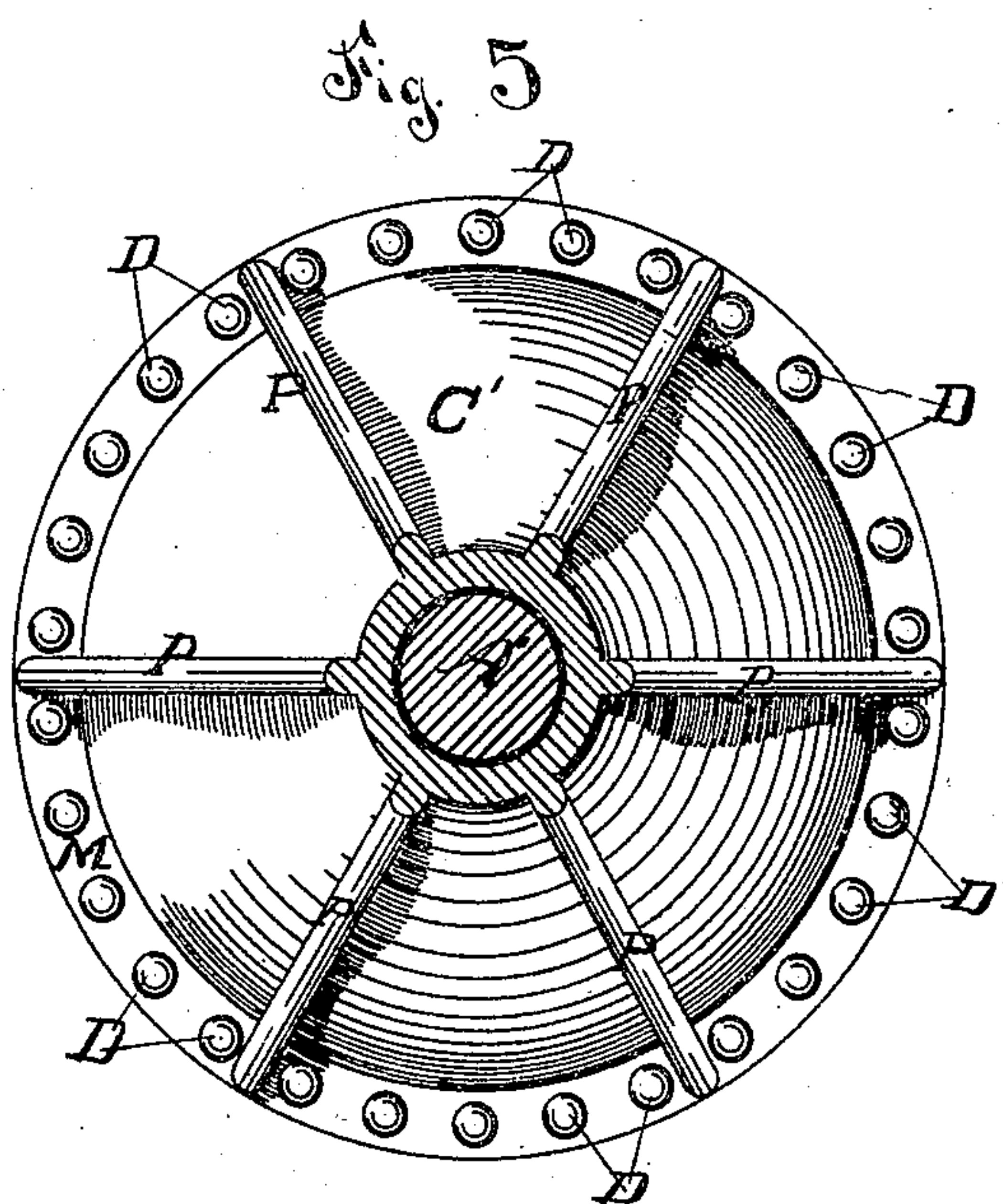
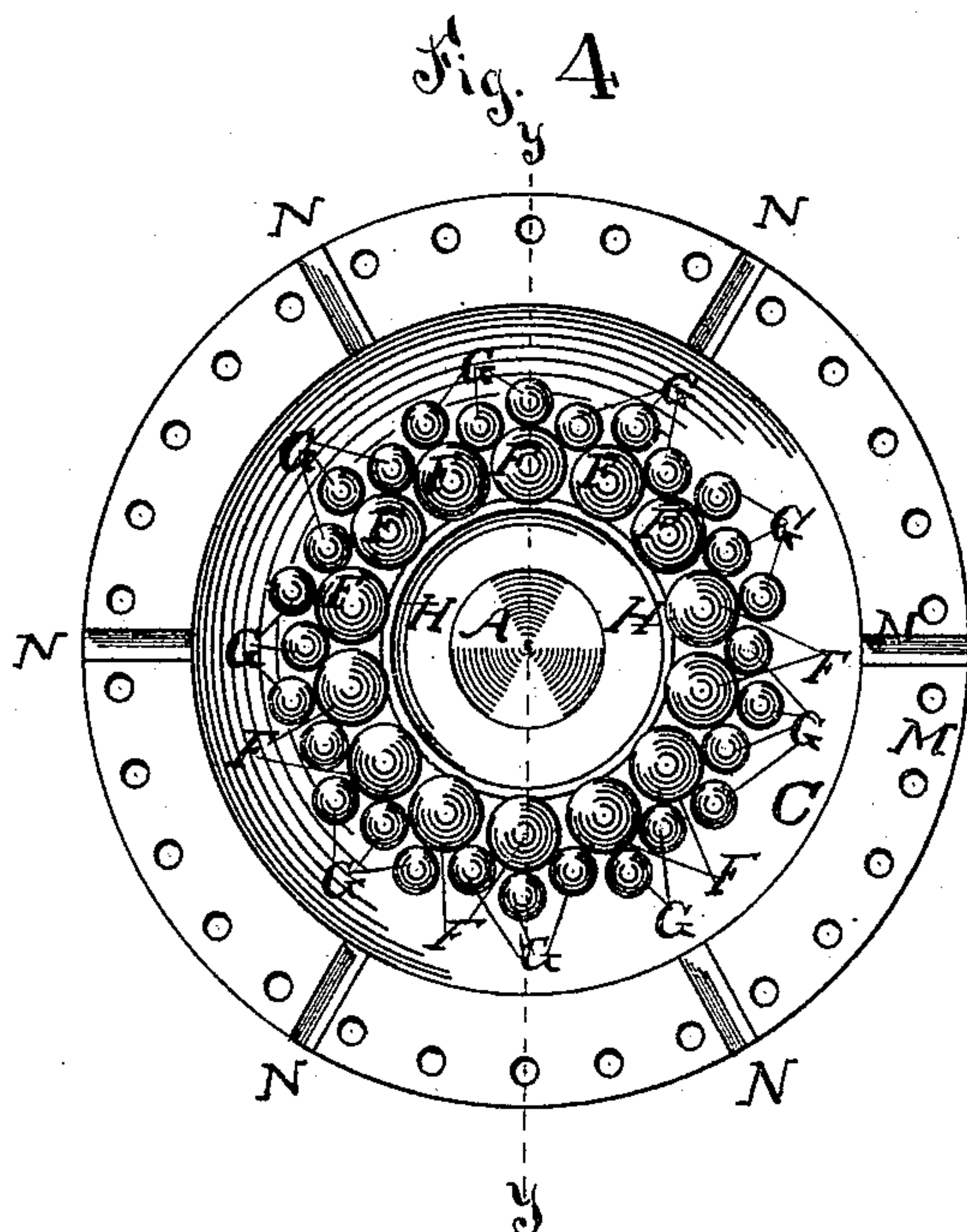
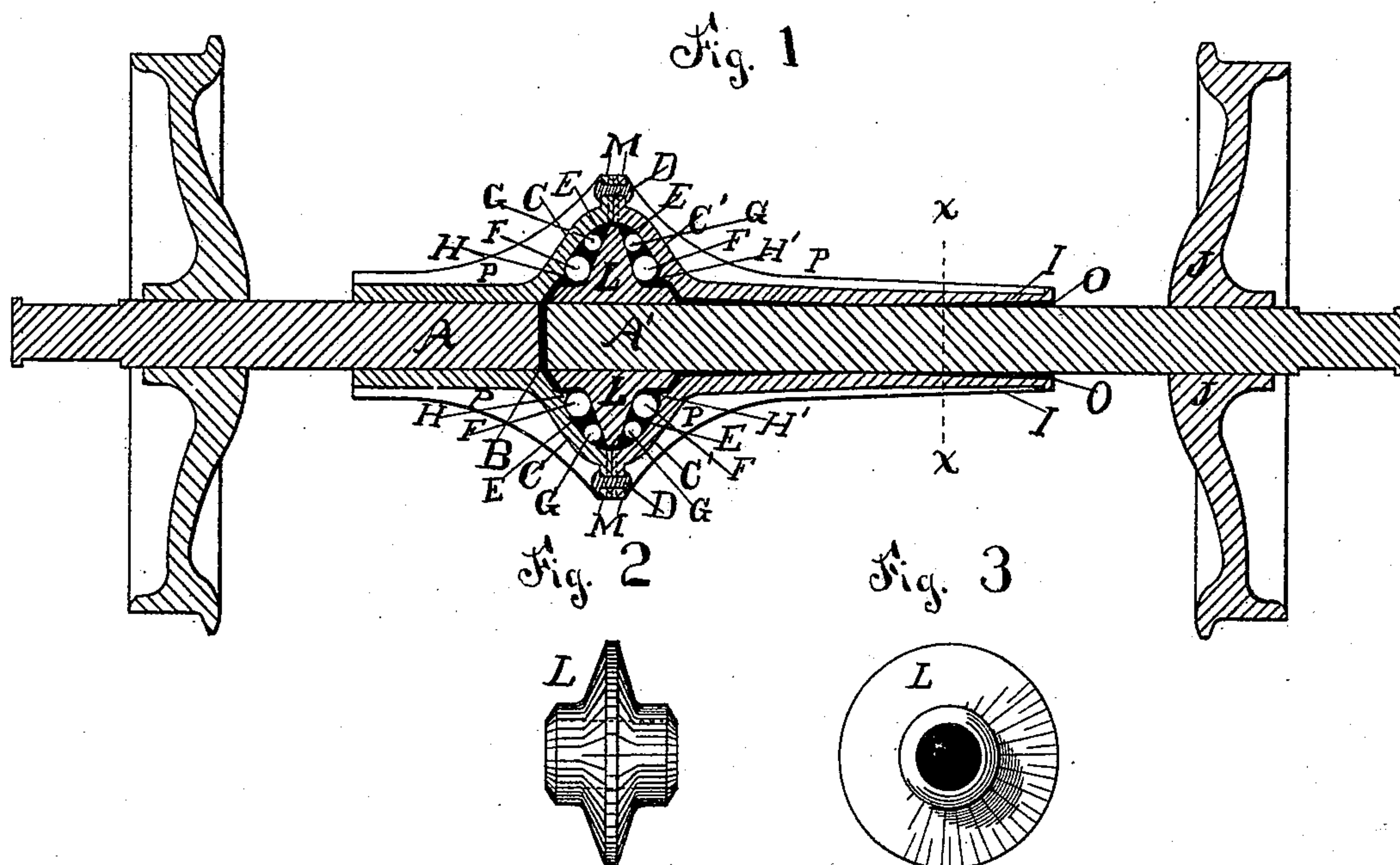
(No Model.)

W. HAYES.

CAR AXLE.

No. 395,901.

Patented Jan. 8, 1889.



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CAR-AXLE.

SPECIFICATION forming part of Letters Patent No. 395,901, dated January 8, 1889.

Application filed May 18, 1888. Serial No. 274,288. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HAYES, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Car-Axles, of which the following is a specification.

My invention relates to the class of divided car-axles adapted to allow the wheels fixed thereon to revolve independently to avoid the friction of the wheels on the rails in running around curves.

The object of my invention is to devise a simple coupling whereby the divided axle may be secured together, and whereby the wear of the several parts will be so compensated that the utility of the axle will not be impaired thereby; also to avoid the necessity of oiling and attention.

My invention comprises a hub fixed upon the severed end of one section of the divided axle and inclosed within a case fixed upon the severed end of the other section of the divided axle and inclosing the hub, leaving on each side of the hub, between it and the case, an annular chamber, the cross-section of which tapers from the inside of the annular chamber toward the periphery thereof—that is to say, the walls of the annular chamber converge, so that if they were extended they would come together. Within these chambers are placed loose bodies, preferably spheres, which are larger in cross-section than the cross-section of the outer edge or periphery of the annular chamber. When the axle revolves, the loose bodies are thrown outward by the centrifugal force, thus wedging in between the hub and case and preserving contact at all times when the axle is revolving, thus preventing any slack at the joint.

My invention will be more fully understood by the accompanying drawings, which illustrate a car-axle and attachments embodying the principle of my invention.

Figure 1 is a longitudinal section of a car-axle embodying my invention. Fig. 2 is an elevation of the hub I use. Fig. 3 is a plan of the same. Fig. 4 is a view looking down into that half of the case which is shrunk upon the severed end of one section of the axle. Fig. 5 is a plan view of the outside of

the case, the axle and sleeve I being cut at the point indicated by the line X X, Fig. 1.

A A' is the axle divided as at B.

C C' are the two sections of the case secured together by rivets D, to form the outer walls of the chamber E, in which the loose bodies F G are placed.

It is obvious that various means can be devised for carrying out my invention, and I do not wish to be strictly limited to the exact devices shown in the drawings, as the principle of my invention consists in the use of loose bodies confined in chambers, the cross-section of which, taken on line of the axle, tapers outward from the axle, located upon opposite sides of a hub fixed upon one of the severed ends of the axle and surrounded by a case fixed upon the other severed end of the axle, whereby the centrifugal force induced by the rotation of the axle projects the loose bodies into the narrower portion of the chamber and preserves contact between the hub and the case.

The device shown in the drawings is adapted to be put together in the following manner: That half of the case marked C is shrunk upon the severed end A, which is then placed erect with the open end of the case C uppermost. The balls F and G are then placed in the open end of the case, and are held from rolling down into the center of the case by the annular rib H. The other portion of the axle is now placed erect, with the severed end A upward, and the half of the case marked C' is placed upon the axle and allowed to slip down until the sleeve I rests upon the car-wheel J. The hub L is then shrunk upon the severed end of this section of the axle, and the balls F G are placed in position in the case C' in the same manner as in the other case, being held by the rib H' from rolling down against the axle. The case is then raised until the balls strike against the hub, as shown in Fig. 1, and is temporarily clamped there. Then while the case is in that position its section A' of the axle is turned upside down and the hub inserted into the other half, C, of the case. The flanges M of the two halves of the case are then secured together with hot rivets, and the axle is ready for use.

N N are openings through which the rust, dust, and scale from the balls and the inside of the case may pass out. The sleeve I fits loosely upon the axle, and the air will be im-
 5 pelled by its centrifugal force to pass into the chamber by the axial opening O, and out through the peripheral openings N, thus keep-
 ing up a current to relieve the coupling from dust, &c.

10 P P are ribs to strengthen the case.

The sleeve I is extended along the axle to brace the same in case of severe strain, such as might occur by reason of derailment.

The loose bodies placed in the chambers
 15 are preferably of such shape as to serve as anti-friction rollers; but a degree of utility would be secured with loose bodies of irregular or angular form in place of the rollers, because such bodies would fill the spaces be-
 20 tween the hub of one section of the axle and the case of the other section of the axle, and thereby preserve the contact and compensate for wear.

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

1. In a car-axle, the combination of the hub fixed upon the severed end of one section of the divided axle, the case fixed upon the sev-
 30 ered end of the other section of the axle and inclosing the hub and leaving on each side of the hub, between it and the case, an annular chamber, the cross-section of which tapers from the inside of the annular chamber to-
 35 ward the periphery thereof, and anti-friction rollers within the chambers larger in cross-section than the cross-section of the outer edge of the annular chamber.

2. The combination of the hub L, fixed upon the severed end of one section of the divided
 40 axle, the case C C', fixed upon the severed end of the other section of the divided axle, inclosing the hub and leaving an annular chamber, E, upon each side of the hub between
 45 it and the walls of the case, and the balls F G within the chambers.

3. The combination of the sections A A' of the axle, the case C C', provided with the an-
 50 nular ribs H H', the hub L, and the balls F G.

4. The combination of the sections A A' of
 50 the axle, the case C C', provided with the axial opening O and the peripheral openings N, the hub L, and the balls.

5. The combination of the sections A A' of the axle, the case C C', provided with the
 55 sleeve I, the hub L, and the loose balls within the chamber E.

6. In a car-axle, anti-friction rollers con-
 60 fined in chambers, the cross-section of which, taken on line of the axle, tapers outward from the axle, such chambers being located upon
 opposite sides of a hub fixed upon one of the severed ends of the axle and surrounded by
 a case fixed upon the other severed end of the axle, the hub, and the case forming the
 65 walls of such chamber, whereby the centrifugal force induced by the rotation of the axle projects the loose bodies into the narrower portion of the chamber and preserves contact between the hub and the case.

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