

No. 837,009.

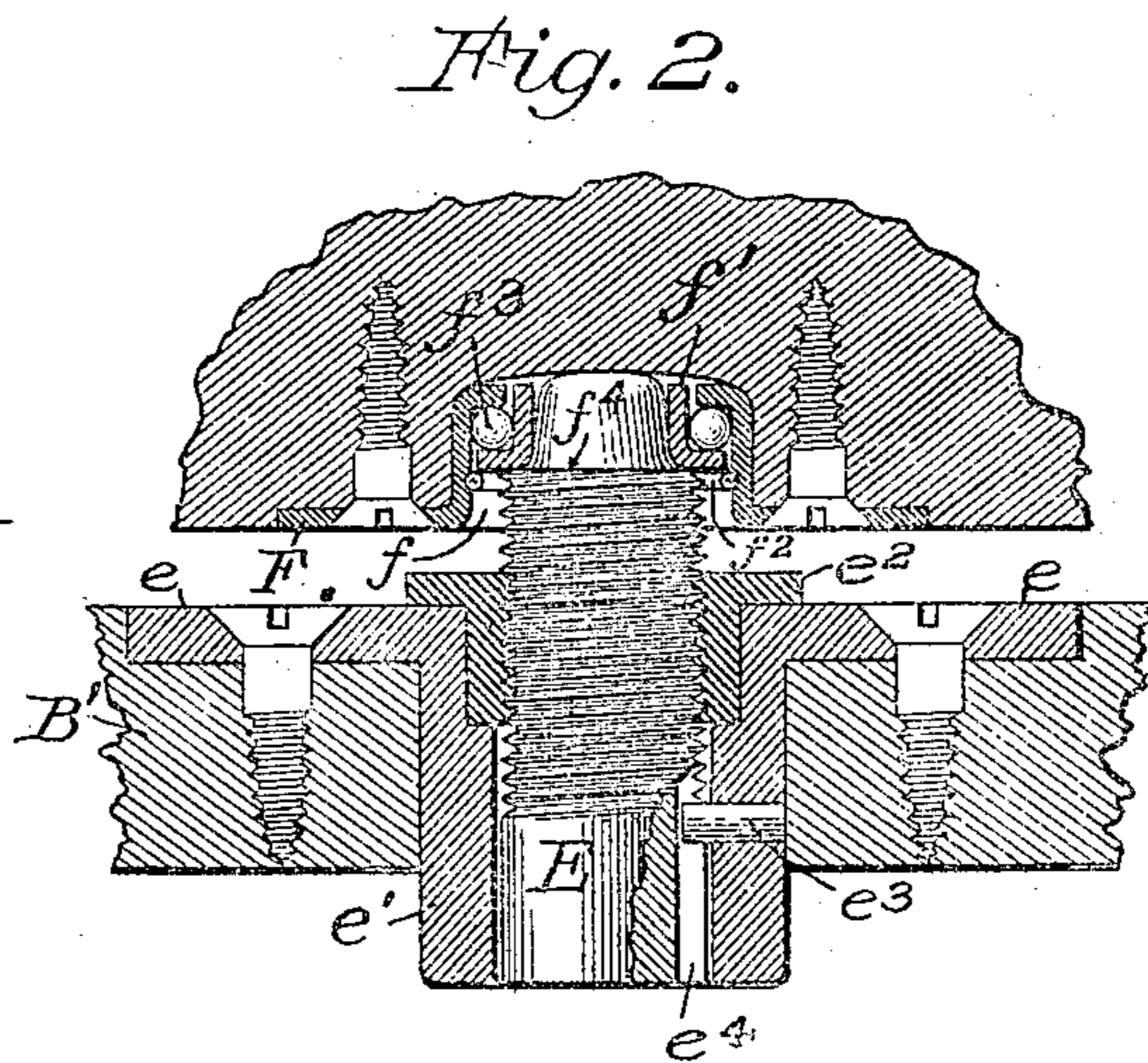
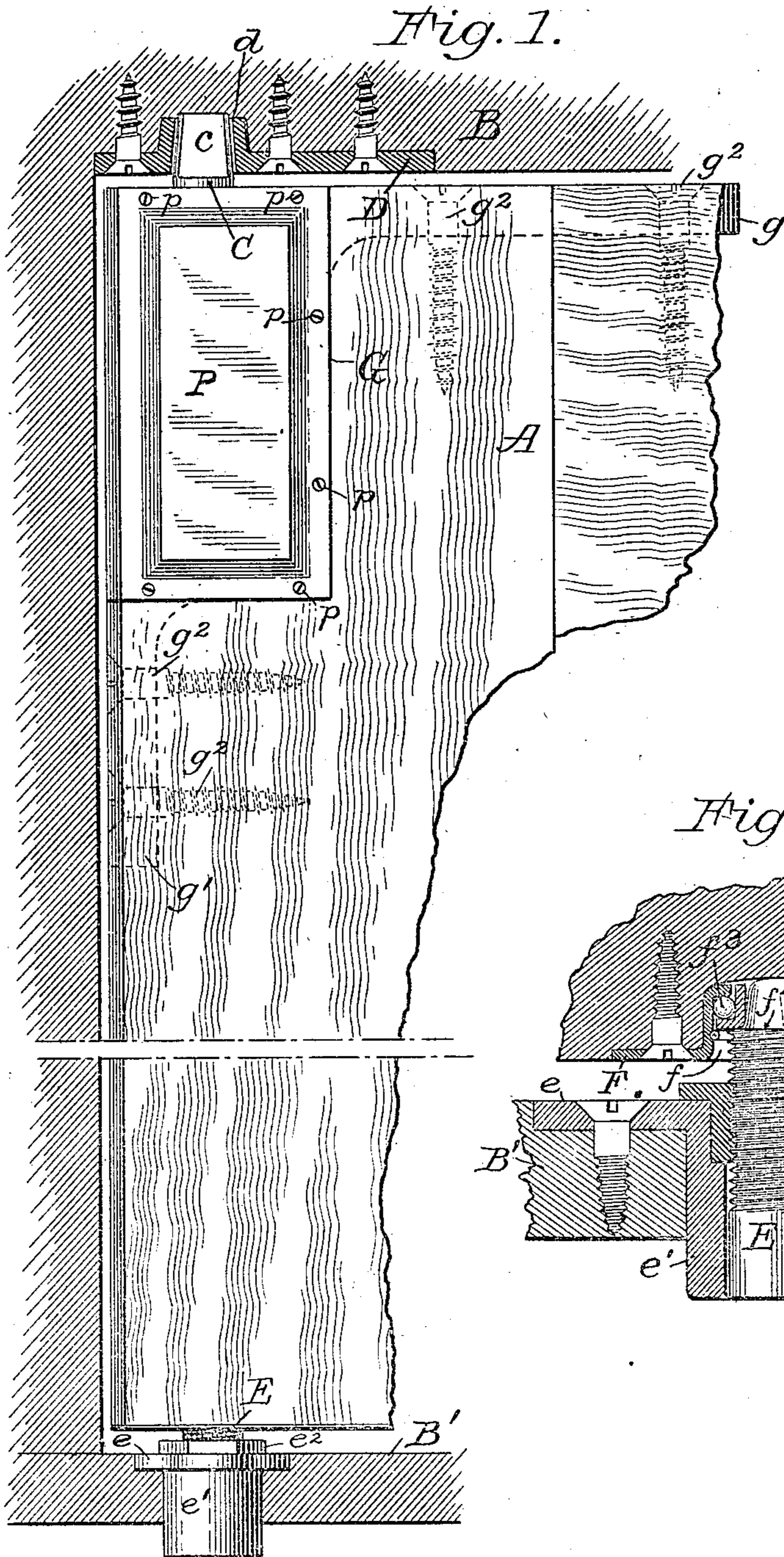
PATENTED NOV. 27, 1906.

C. S. VAN WAGONER & LE DRU R. POMEROY.

SPRING HINGE.

APPLICATION FILED SEPT. 30, 1904.

3 SHEETS—SHEET 1.



Attest:  
C. L. Powell  
B. F. Chadwell

Inventors:  
Cornelius S. Van Wagoner  
Le Dru R. Pomeroy  
By *Dorwell & Little*  
Attorneys.

No. 837,009.

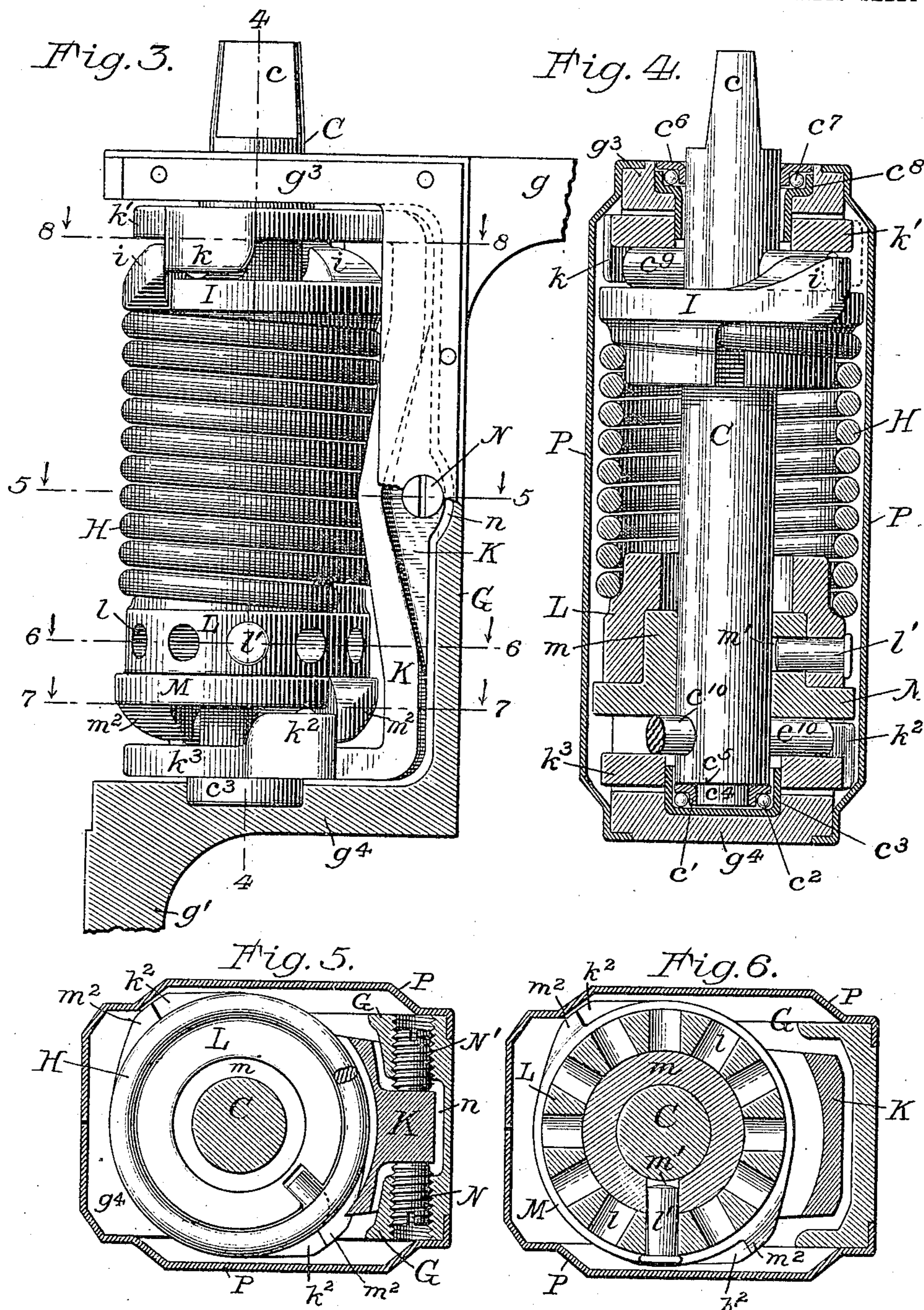
PATENTED NOV. 27, 1906.

C. S. VAN WAGONER & LE DRU R. POMEROY.

SPRING HINGE.

APPLICATION FILED SEPT. 30, 1904.

3 SHEETS—SHEET 2.



Attest:  
*R. P. Powell*  
*J. F. Chadwell*

Inventors:  
 Cornelius S. Van Wagoner,  
 Le Dru R. Pomeroy  
 By *Howell Bartle*  
 Attorney.

No. 837,009.

PATENTED NOV. 27, 1906.

C. S. VAN WAGONER & LE DRU R. POMEROY.

SPRING HINGE.

APPLICATION FILED SEPT. 30, 1904.

3 SHEETS—SHEET 3.

Fig. 7.

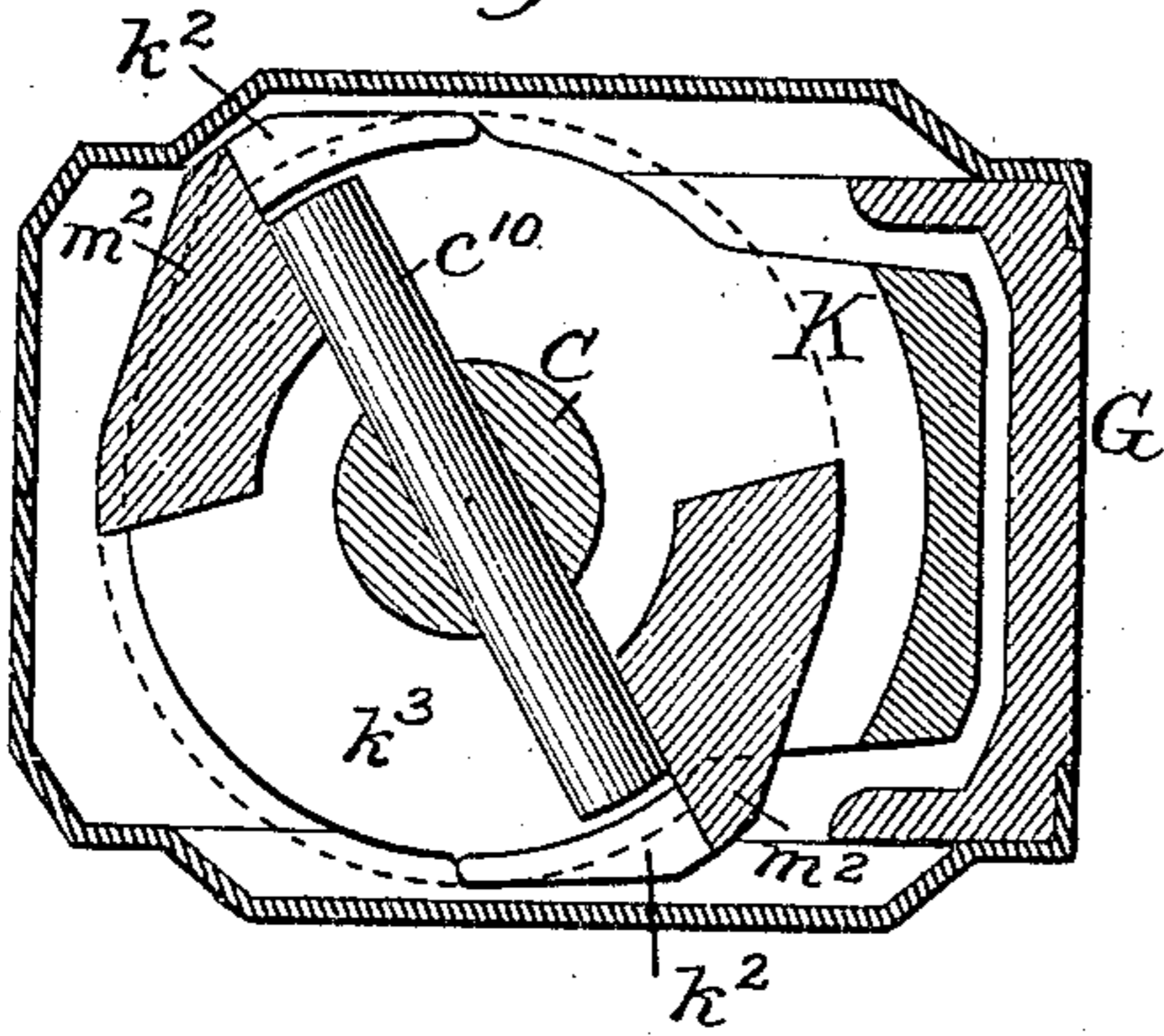


Fig. 8.

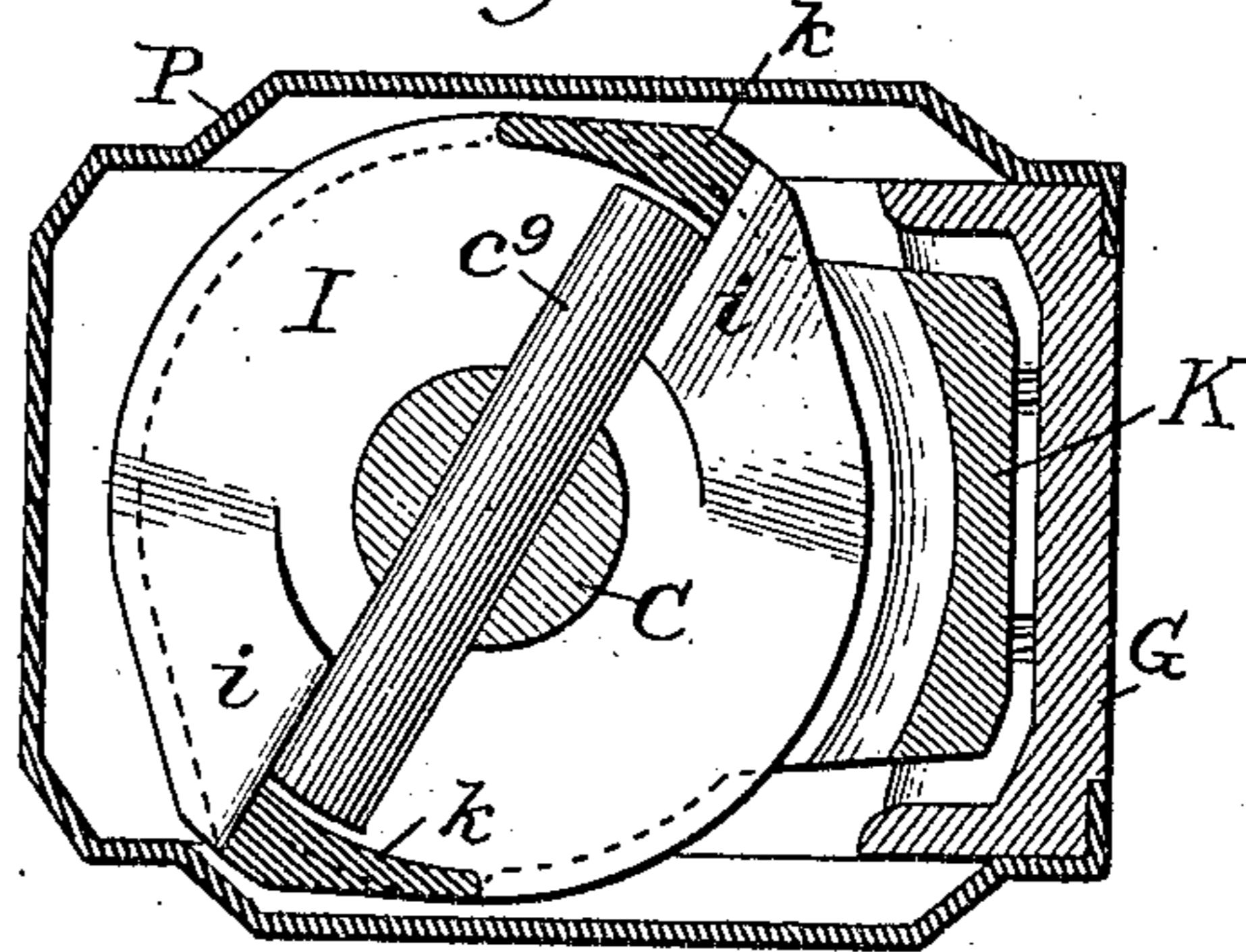


Fig. 9.

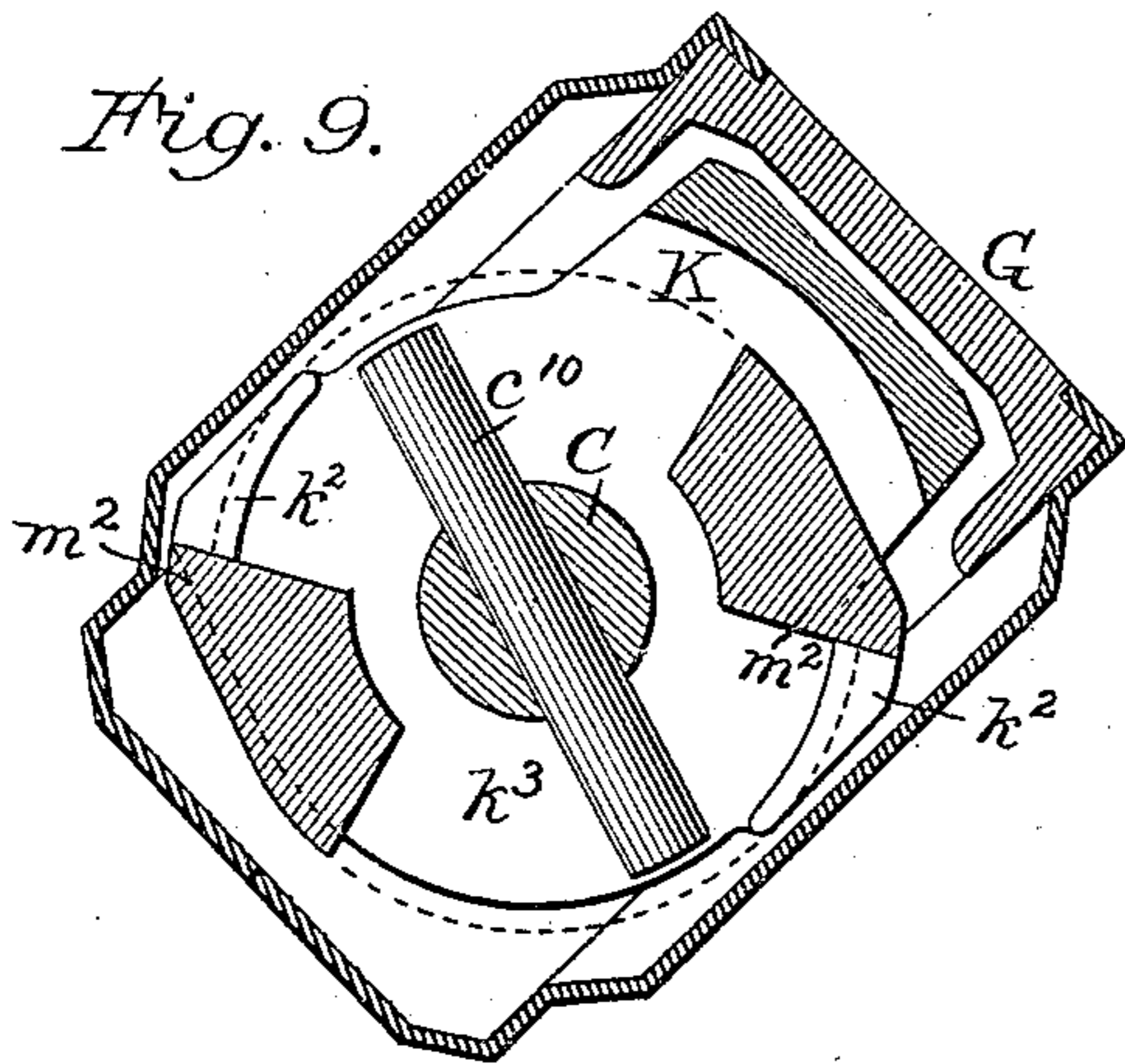


Fig. 10.

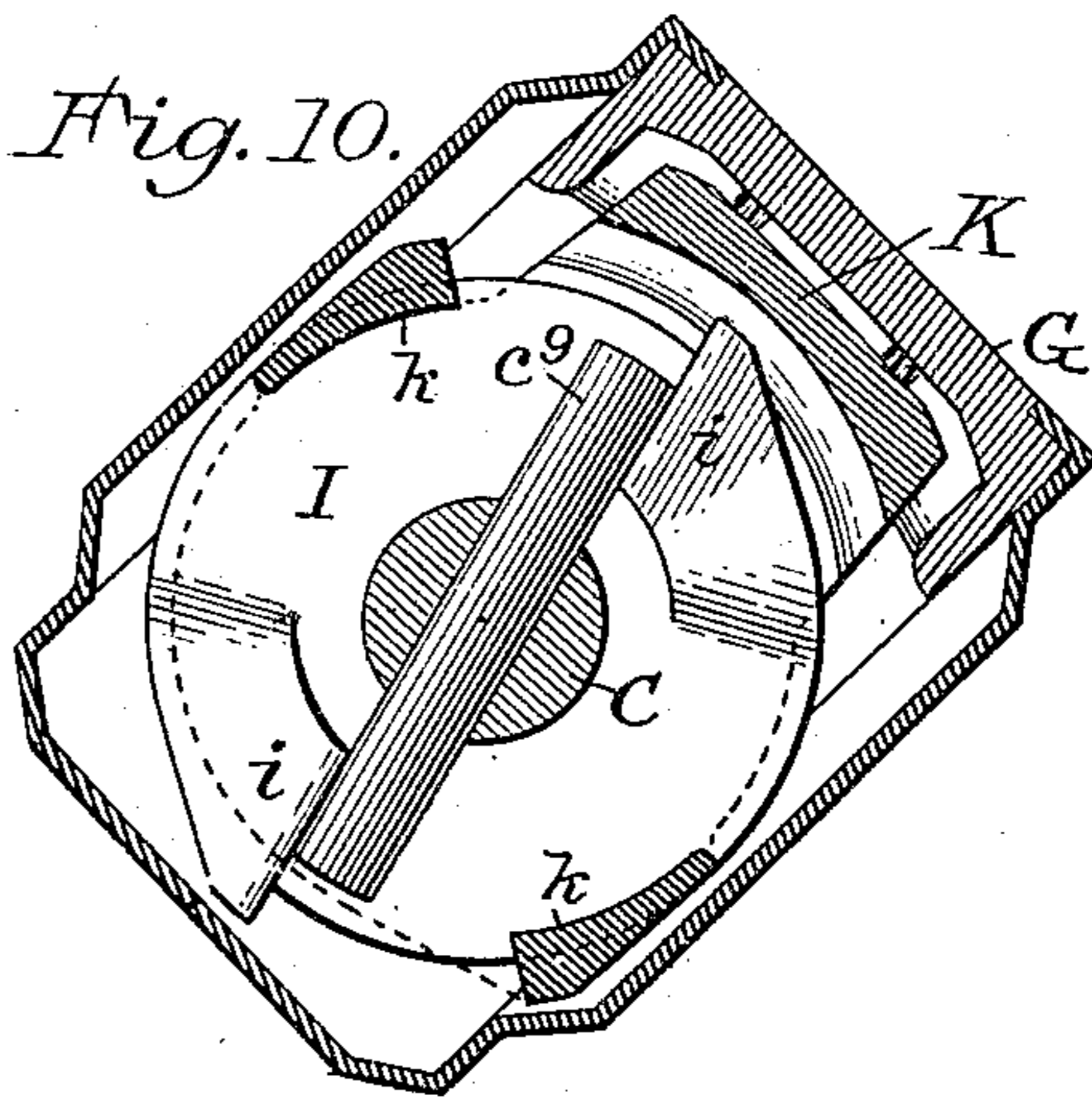


Fig. 11.

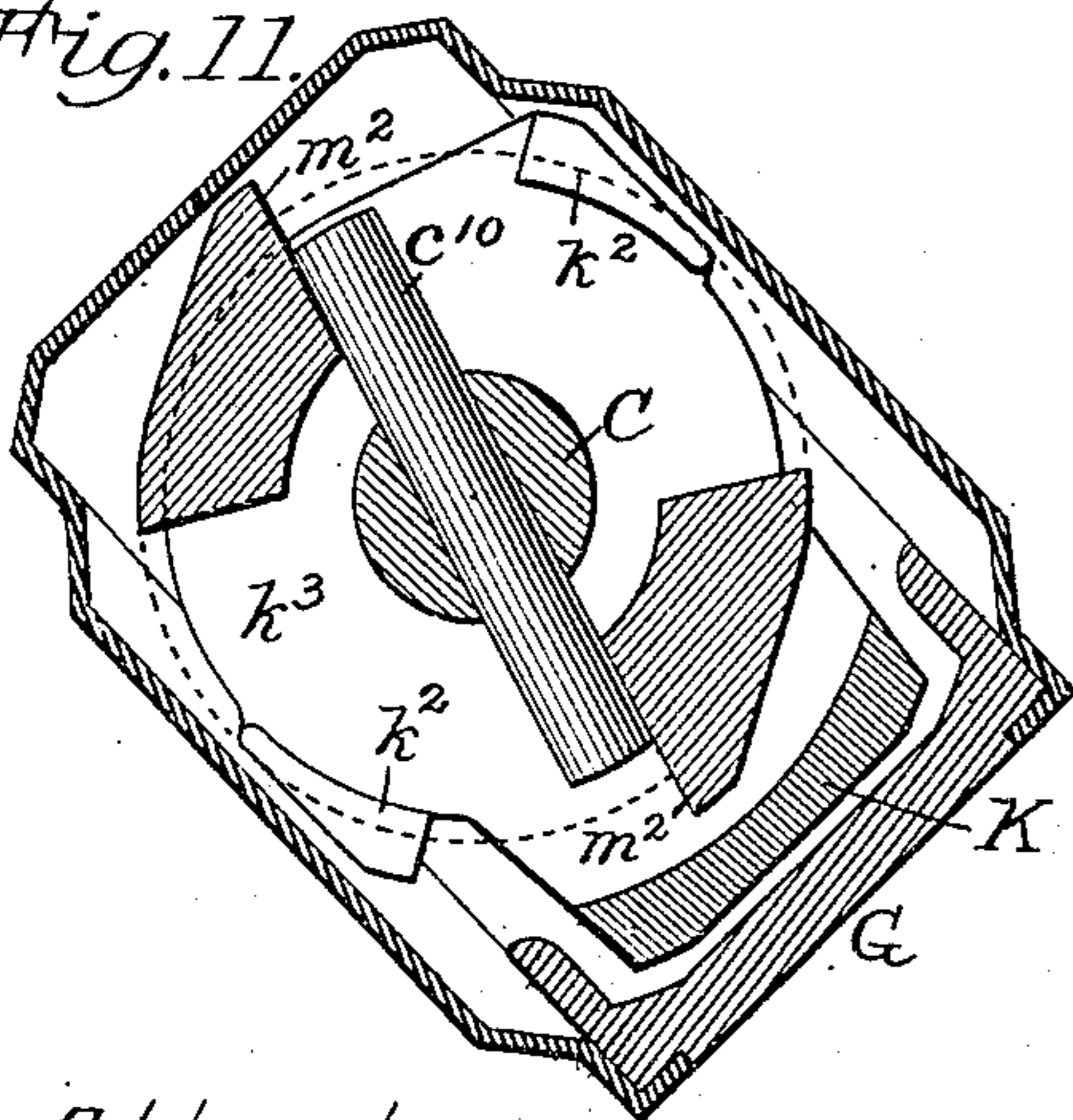
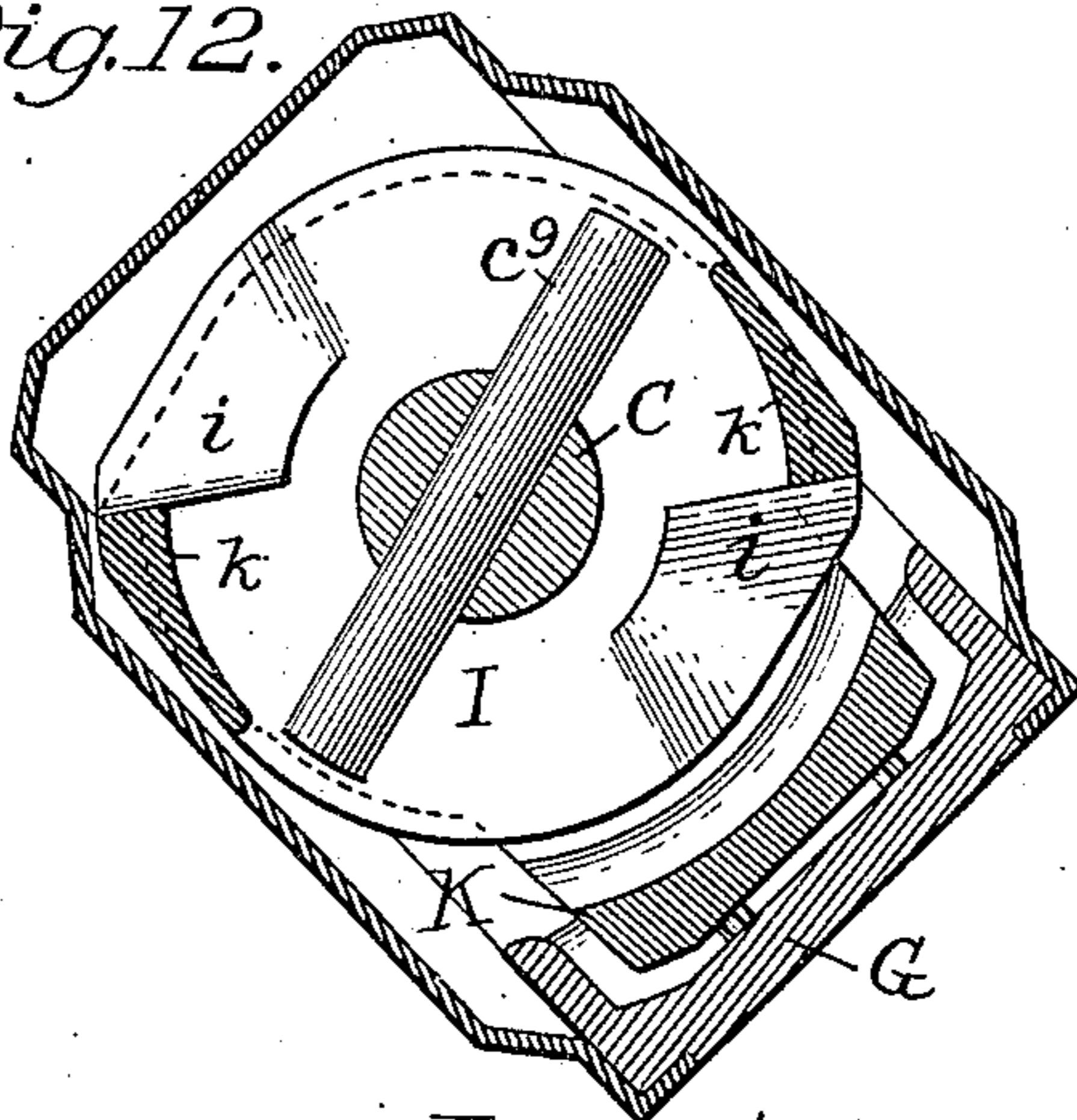


Fig. 12.



Attest:  
A. P. Powell  
B. J. Chadwell

Inventors:  
Cornelius S. Van Wagoner.  
Le Dru R. Pomeroy.  
By *Howell Gantt*  
Attorney.

# UNITED STATES PATENT OFFICE.

CORNELIUS S. VAN WAGONER AND LE DRU R. POMEROY, OF CLEVELAND, OHIO, ASSIGNORS TO THE VAN WAGONER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF DELAWARE.

## SPRING-HINGE.

No. 837,009.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed September 30, 1904. Serial No. 226,659.

*To all whom it may concern:*

Be it known that we, CORNELIUS S. VAN WAGONER and LE DRU R. POMEROY, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Spring-Hinges, of which the following is a specification.

Our invention relates to that class of double-acting spring-hinges which are designed to be applied for pivotally supporting a door at its top or bottom edge instead of at the rear side edge; and said invention consists in the novel features hereinafter described, and particularly pointed out in the claims hereunto annexed.

In the drawings furnished and forming a part of this specification, Figure 1 is an elevation of a portion of a door and door-casing, showing our improved hinge as applied to the upper rear corner of the door. Fig. 2 is a sectional view of the pivot, shown in Fig. 1 as being mounted for supporting the lower edge of the door. Fig. 3 is a side view of our improved hinge with the detachable portion of the casing removed and a portion of the main frame broken away. Fig. 4 is a vertical section of said hinge on line 4 4 of Fig. 3. Fig. 5 is a horizontal sectional view on line 5 5 of Fig. 3. Fig. 6 is a horizontal sectional view on line 6 6 of Fig. 3. Figs. 7 and 8 are horizontal sections, respectively, on lines 7 7 and 8 8 of Fig. 3. Figs. 9 and 10 are views corresponding to Figs. 7 and 8, showing the positions of the parts when the hinge-frame or door is turned to the right; and Figs. 11 and 12 are similar views showing the positions of the parts when the hinge-frame or door is turned to the left.

Modern building construction has rendered it practically impossible in some instances to mount a "pivot-hinge" in the door-sill or in the floor directly beneath the bottom edge of the door, and for this reason our hinge is designed to be attached either to the lower or the upper rear corner of a door, as may be preferred; but it will be apparent that certain features of our invention may be applied to a hinge designed to be mounted in the floor or door-sill.

The hinge illustrated in the drawings is shown in Fig. 1 as being mounted at the

upper rear corner of a door A, the latter being pivotally connected to the door-casing B by the hinge-spindle C, which enters a socket *d*, formed in a plate D, which is secured to the door-casing, as clearly shown.

The bottom edge of the door rests upon a pivot or stud E, which is adjustably mounted in a plate *e*, the latter being secured in the floor or door-sill B' so that the stud E will be in axial alinement with the spindle C of the hinge. The plate *e* is provided with a hub or sleeve *e'*, in which the stud E is mounted, said stud being externally screw-threaded to receive a nut *e*<sup>2</sup>, which is seated in the upper end of the hub *e'* for supporting the stud in the hub, as clearly shown in Fig. 2. In the bottom edge of the door A is a socket *f*, formed in a plate F, and in said socket is a ball-bearing cone *f'*, which is held in the socket by a wire ring *f*<sup>2</sup>, seated in a groove formed in and around the interior wall of the socket adjacent to the lower edge of the cone.

Between the cone *f'* and the walls of the socket is a series of antifriction-balls *f*<sup>3</sup>, the whole affording an antifriction-bearing for the stud E, said stud being reduced in size at its upper end to enter the central opening in the ring or cone *f'* and to afford a shoulder *f*<sup>4</sup>, upon which the cone rests for supporting the door. The said stud E is raised and lowered for securing the door in or removing it from its casing by turning the nut *e*<sup>2</sup>, the stud being held against rotation by a pin *e*<sup>3</sup>, secured to the hub *e'* and projecting into a groove or slot *e*<sup>4</sup> in the stud, as will be readily understood.

As shown in Figs. 1 and 3 of the drawings, the main frame G of the hinge is shaped to fit a substantially rectangular mortise cut in the corner of the door, said frame forming three sides of a casing or inclosure in which the working parts of the hinge are housed and being provided with extensions or straps *g* and *g'* for securing it to the door by means of screws *g*<sup>2</sup>, as clearly shown in Fig. 1. The spindle C is mounted in the parts *g*<sup>3</sup> and *g*<sup>4</sup> of the main frame, which form the top and bottom or the two end plates of the hinge-casing. Said spindle projects through the part *g*<sup>3</sup> and is provided with a non-circular head *c*, which enters a similar-shaped socket *d* in the plate D, already referred to, said spindle being held

by said plate against rotation, as will be readily understood. Both of the spindle-bearings are provided with ball-bearings. The lower bearing consists of a hard-metal ring or cone  $c'$ , mounted on antifriction-balls  $c^2$ , which are confined in a hard-metal cup  $c^3$ , the latter being inserted in a depression formed in the part  $g^4$  of the main frame. The spindle has a reduced end  $c^4$ , which enters the ring or cone  $c'$ , the shoulder  $c^5$  bearing upon the cone, as clearly shown in Fig. 4. At the opposite end of the spindle there is a hard-metal ring or cone  $c^6$ , which tightly fits the spindle and which bears upon or against antifriction-balls  $c^7$ , held in a hard-metal cup or raceway  $c^8$ , mounted in the part  $g^3$  of the main frame. These bearings are such as to adapt the hinge for use either at the upper or the lower rear corner of a door, as may be preferred.

The hinge-controlling spring H surrounds the spindle and has one end secured to a disk I, mounted on the spindle and provided with a pair of stops or projections  $i i$ , located on opposite sides of the spindle, which bear against the opposite ends of a pin  $c^9$ , driven through a hole in the spindle and projecting laterally from opposite sides thereof. The stops  $i i$  on the disk I also bear against stops  $k k$ , which project from a disk  $k'$ , forming one end of a yoke K, which is pivotally mounted on the spindle C.

The opposite end of the spring is secured to a tension-regulating disk L, which surrounds the spindle and also surrounds a hub  $m$  of a disk M, the two disks being adjusted with reference to each other for regulating the tension of the spring by means of the holes  $l$  in the disk L, the hole  $m'$  in the hub of the disk M, and the connecting-pin  $l'$ , as will be readily understood. The disk M is provided with a pair of stops  $m^2$ , which bear on opposite ends of a pin  $c^{10}$ , projecting laterally from opposite sides of the spindle C. Said stops  $m^2$  also bear against stops  $k^2$  on a disk  $k^3$ , which forms the other end of the yoke K. The stops  $m^2 m^2$  on the disk M and the stops  $i i$  on the disk I are arranged to bear in opposite directions on the spindle through the pins  $c^9$  and  $c^{10}$  and also on the stops  $k k$  and  $k^2 k^2$  on the disks  $k'$  and  $k^3$  to cause the spring H to be wound at one end when the main frame is moved in one direction and to be wound at the opposite end when said frame is moved in the other direction, the opposite end of the spring in each case being held stationary by the spindle C.

It will be noted that the yoke K is pivotally mounted on the spindle C by reason of the fact that said spindle passes through the disk  $k'$  and  $k^3$ , which form the ends of the yoke. These disks are connected together to form a yoke in order that the stops carried thereby may be simultaneously adjusted

with respect to the main frame. These stops are acted upon by the spring H to return the main frame to a central position whenever said frame has been moved in either direction, and in order that this central position may coincide with the position the door should occupy when closed it is often necessary to adjust said stops so that the door when in its position of rest will occupy the desired position. The adjustment is effected by moving the yoke K. The latter, as shown in Fig. 5, projects into a slot  $n$  in the main frame, said slot being of a width sufficient to provide for the necessary movement. The main frame is provided with two screws  $N N'$ , which bear on opposite sides of the yoke to form adjustable locking-abutments. It will be readily seen that by withdrawing one of said screws and advancing the other the position of the yoke may be changed for varying the location of the stops carried thereby.

For the purpose of clearly illustrating the operation of the hinge we have illustrated in Figs. 7 to 12, inclusive, the positions of the stops, first, when the hinge is in its normal position of rest; second, when it has been moved to the right, and, third, when it has been moved to the left. Figs. 7, 9, and 11 are sectional views on line 7 7 of Fig. 3, and Figs. 8, 10, and 12 are similar views taken on line 8 8 of Fig. 3.

The stops  $k^2 k^2$  at the lower end of the yoke K, Figs. 7, 9, and 11, and the stops  $k k$  at the upper end of said yoke, Figs. 8, 10, and 12, move with the main frame. The spindle C is held stationary by its engagement with the socket  $d$  in the door-frame. The stops  $m^2 m^2$ , being connected to the lower end of the spring H, bear (when the hinge is in its normal position of rest) directly against the stops  $k^2 k^2$  and also against the pin  $c^{10}$ , carried by the spindle, as shown in Fig. 7, while the stops  $i i$ , which are connected to the other end of the spring, bear against the stops  $k k$  and also against the pin  $c^9$  of the spindle C. When the main frame is moved to the right, the spring is wound at the bottom by pressure of the stops  $k^2 k^2$  on the stops  $m^2 m^2$ , as shown in Fig. 9; the other end of the spring being held stationary by the pin  $c^9$ , which is in engagement with the stops  $i i$ , as shown in Fig. 10. When the main frame is moved to the left, as shown in Figs. 11 and 12, the lower end of the spring is held stationary by the engagement of stops  $m^2 m^2$  with the pin  $c^{10}$ , the other end of the spring being wound by pressure of the stops  $k k$  on the stops  $i i$ , the spring operating to return the door to its closed position regardless of the direction in which it has been moved, as will be readily understood. The working parts of the hinge are completely housed by means of the thin sheet-metal plates P P, which are secured to the main frame by means of the screws  $p$ ,

(shown in Fig. 1,) and it will be seen that by removing said plates all parts of the hinge are accessible for adjustment and repairs without removing the hinge from the door to which it is attached.

Should it become necessary to replace the spring or any other part of the hinge, this may be done by removing the pins  $c^9$  and  $c^{10}$  from the spindle C. The parts of the hinge may then be separated without removing the main frame from the door.

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

1. In a spring-hinge of the character described, a main frame, a spindle mounted therein having a pair of projections or stops against which the opposite ends of the controlling-spring may operate, a spring mounted on said spindle between said stops having its opposite ends arranged to bear upon said stops in opposite directions, separate stops carried by the main frame also arranged to be operated upon in opposite directions by the opposite ends of said spring and means for simultaneously adjusting the last-mentioned stops for the purpose set forth.

2. In a spring-hinge of the character described, a main frame adapted to be secured to a door or gate, a spindle mounted therein having a non-circular projecting end for engagement with a suitable socket in the door-frame, said spindle being provided with stops or projections against which the controlling-spring may operate, a spring having its opposite ends arranged to operate against said stops in opposite directions, separate stops carried by the main frame adapted when said frame is moved on said spindle to bear against the action of said spring at one end or the other according to the direction of movement of said frame, and means for simultaneously adjusting said separate stops with respect to the main frame.

3. In a spring-hinge of the character described, a main frame, a spindle mounted therein having stops or projections against which the controlling-spring may operate, a spring having its opposite ends arranged to operate against said stops in opposite directions, a yoke embracing said spring having its two ends mounted on said spindle, said ends being provided with stops or projections adapted to operate against the opposite ends of said spring, and means for locking said yoke to the main frame and for adjusting its position with respect thereto as and for the purpose specified.

4. In a spring-hinge of the character described, a main frame, a spindle mounted therein having stops or projections adapted to be operated upon by a controlling-spring, separate stops carried by the main frame, a pair of disks having stops adapted to bear

in opposite directions against the stops on the spindle and also against the stops carried by the main frame, a controlling-spring mounted between said disks having one of its ends connected to one of said disks and the other end connected to the other of said disks, and means for simultaneously adjusting the stops carried by the main frame.

5. In a spring-hinge of the character described, a main frame adapted to be secured to a door or gate and constructed to form the main supporting-walls of a receptacle in which the working parts of the hinge are housed, a spindle mounted in said frame having stops or projections against which the controlling-spring may operate, separate stops carried by the main frame, means for adjusting the last-mentioned stops with respect to the main frame, a controlling-spring having its ends arranged to operate in opposite directions against the stops on the spindle and the stops on the main frame, means for adjusting the tension of said spring, and removable plates secured to said frame for completely housing the spring and its connecting mechanism.

6. In a spring-hinge of the character described, a main frame constructed to form the main supporting-walls of a receptacle in which the working parts of the hinge are housed, said frame having open sides and being of a width substantially equal to the thickness of the door to which it is to be attached, means for securing said frame to the corner of a door, a spindle mounted in said frame having a non-circular head projecting therefrom, a spring within said frame adapted to operate against said spindle and also against said frame for maintaining said frame in a desired position of adjustment and operating to return said frame to such position when moved in either direction on or around said spindle, means for adjusting the normal position of said frame with respect to the spindle, and side plates removably secured to said frame for completely housing the working parts of the hinge, and for affording access thereto.

7. In a spring-hinge of the character described, a main frame adapted to be secured to a door or gate and constructed to form the main supporting-walls of a receptacle in which the working parts of the hinge are housed, a spindle mounted in said frame, stops or projections carried by said spindle, said stops or projections consisting of removable pins inserted in suitable holes in said spindle, separate stops carried by the main frame, a pair of disks mounted on said spindle provided with stops adapted to bear in opposite directions against the stops on the spindle and also against the stops carried by the main frame, and a controlling-spring having one of its ends connected to one of

said disks and the other connected to the other of said disks, the organization being such that by removing the pins or stops carried by the spindle the working parts of the  
5 hinge may be removed from the main frame without removing the latter from the door to which it may be attached.

In testimony whereof we have hereunto

set our hands in presence of two subscribing witnesses.

CORNELIUS S. VAN WAGONER.  
LE DRU R. POMEROY.

Witnesses:

L. CARDIE,  
F. C. BOND.