No. 848,593. PATENTED MAR. 26, 1907.

C. B. HATFIELD.

FRICTION GEARING.

APPLICATION FILED MAR. 26, 1906.

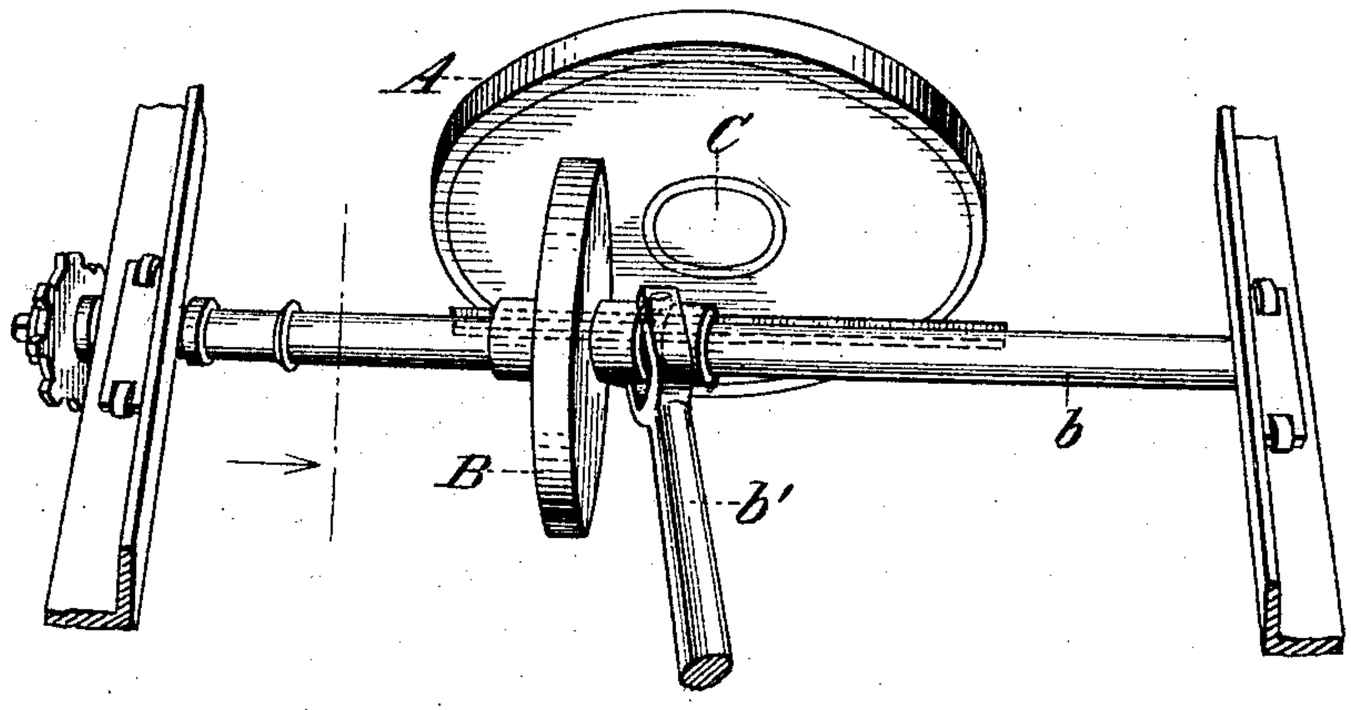

Fig. 1.

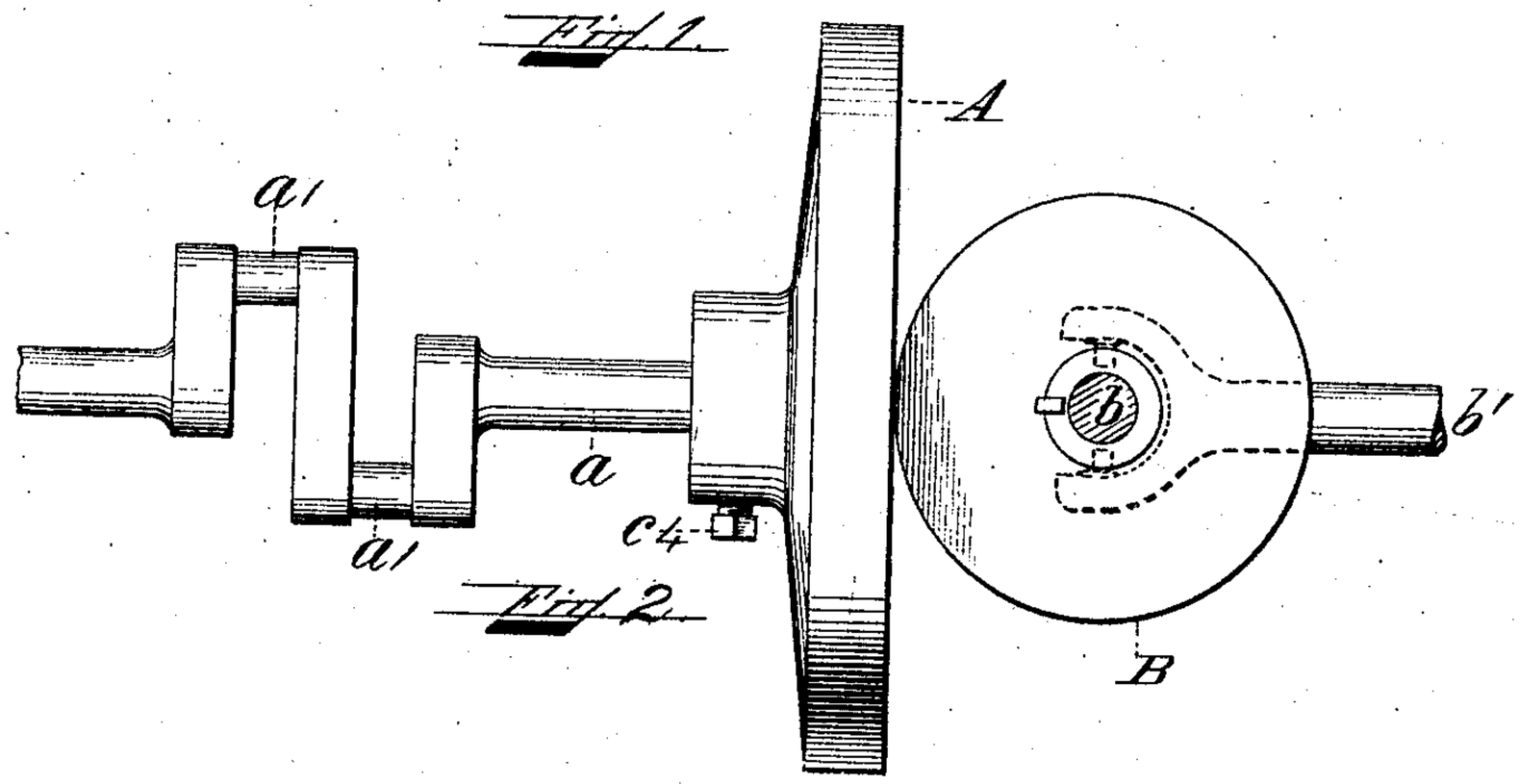

Fig. 2.

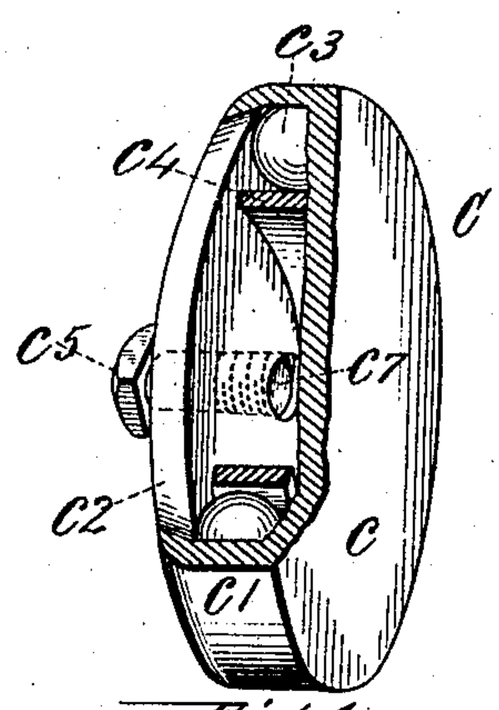

Fig. 4.

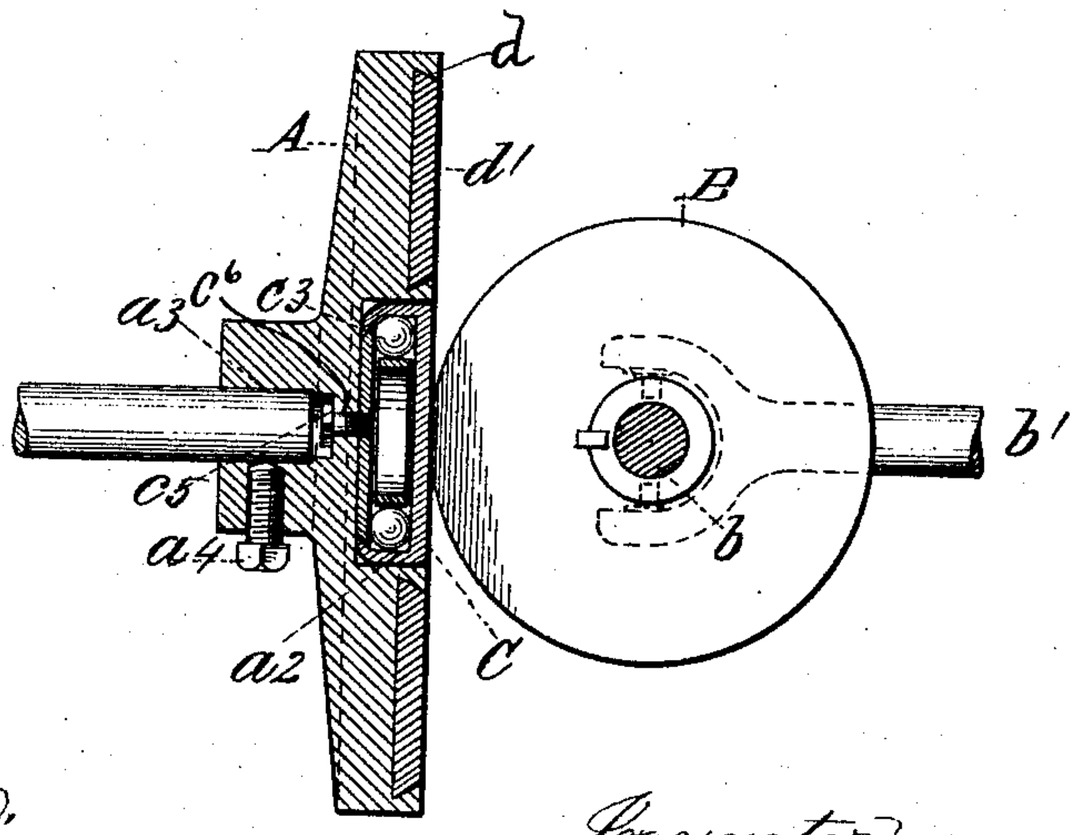

Fig. 3.

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FRICTION-GEARING.

No. 848,593. Specification of Letters Patent. Patented March 26, 1907.

Application filed March 26, 1906. Serial No. 308,045.

To all whom it may concern:

Be it known that I, CHARLES B. HATFIELD, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Friction-Gearing; and I do hereby 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.

The present invention relates to friction-gearing employed for the transmission of power. As is well known to those skilled in this art, such friction-gearing comprises a driving-disk which is rotated by the engine. A driven wheel is mounted upon a shaft at right angles to the driving-disk and arranged to be brought into contact with the face of the driving-disk, whereby the rotations of the driving-disk will rotate the driven wheel, and usually means are provided whereby the driven wheel may be moved along its shaft, by which the point of contact between it and the driving-disk with relation to the axis of the driving-disk may vary the speed at which the driven wheel is rotated or to shift the point of contact to one side or the other of the axis of the driving-disk, whereby to reverse the direction of rotation of the driven wheel.

The object of my invention is to construct a friction-gearing in which there shall be no clutch or disconnecting device, thus permitting the machine to be stopped at will without the use of extra mechanism, such as clutches or mechanism for moving the driven wheel toward and from the driving-disk, greatly simplifying the construction and the ease of operation of the mechanism.

To the above ends my invention consists of the improved friction-gearing which will now be described, and particularly pointed out in the claims.

My invention is shown in the accompanying drawings, in which—

Figure 1 illustrates in perspective my improved friction-gearing. Fig. 2 shows a vertical section. Fig. 3 shows a view similar to Fig. 2, omitting the crank portion of the crank-shaft and showing a vertical sectional view through the axis of the driving-disk. Fig. 4 shows an enlarged view of what I will hereinafter term the "floating rest" of the driving-disk, the cap-plate being broken away to show its interior construction.

Similar reference characters will be employed throughout the specification and drawings to designate corresponding parts.

A represents the driving-disk, which is connected to a crank-shaft *a*, provided with the cranks *a'*, and which shaft is mounted to rotate in any suitable bearings and to be connected and driven from any suitable form of engine.

Coöperating with the driving-disk A is the driven wheel B, mounted upon a shaft *b*, which is supported in suitable bearings in the frame of the machine and at right angles to the shaft *a*, as clearly shown in the drawings. The driven wheel B is arranged with such relation to the face of the driving-disk A that its periphery shall be always in contact with the driving-disk A or the floating rest at the center thereof, which will be hereinafter described, and, as usual in gearing of this character, for the purpose of varying the speed of the driven wheel B such wheel is splined upon the shaft *b* or otherwise arranged to be moved by a forked lever *b'* along the shaft *b*, whereby the driven wheel B may be moved a greater or less distance away from the axis of the driving-disk A or to one side or the other of the axis for the purpose of changing the speed or reversing the direction of rotation of the driven wheel B.

The means for shifting the driven wheel B along its shaft *b* and for securing its rotation with the shaft *b* need not be more fully described, as it may consist of a usual spline, (such as shown in the drawings,) and the yoke-shifting lever *b'* or any other suitable mechanism may be employed for moving the driven wheel B along its shaft and securing its rotation therewith.

In the present invention there is no provision for moving the driven wheel B out of contact with the face of the driving-disk A when it is desired to stop the machine without stopping the engine; but I have provided the driving-disk A with a floating rest at its center, which because of the fact that it can remain at rest when the driven wheel B is in contact therewith while the driving-disk A continues to rotate I have termed a "floating rest." This floating rest C is circular in

form and of a diameter which will permit a suitable bearing-contact of the periphery of the driven wheel B therewith, and it consists of a cap-plate c, having a flange c' and a back plate c^2, the edge of the flange c' being spun or otherwise turned over the periphery of the back plate c^2, so as to hold the parts together, forming a hollow box, as it were, in such manner, however, that the cap-plate c and its flange c' may turn with relation to the back plate c^2

Within the compartment or box formed by the cap-plate c and the back plate c^2 there is provided an antifriction-bearing which may be either a ball-bearing, such as shown, and consisting of a ring of balls c^3 and a ring c^4, supporting the balls, or it may consist of any suitable form of roller-bearing, it being only desirable that the floating rest be supported upon some effective antifriction-bearing.

The driving-disk A is provided with a circular recess a^2 at its center of a depth sufficient to receive the floating rest C, so that the face of the cap-plate c of the rest will lie in the plane of the face of the driving-disk A. The floating rest C may be secured in the recess a^2 in any desired manner which will permit its free relative turning with relation to the driving-disk A.

As shown in the drawings, I secure the floating rest by means of a screw c^5, which passes through a bore c^6 and engages a threaded aperture c^7 in the back plate c^2. The driving-disk A may be secured to its crank-shaft a in any suitable manner, as by providing it with a socket a^3, which receives the end of the crank-shaft a and is held thereto by means of the set-screw a^4.

The periphery of the driven wheel may be provided with any suitable frictional contact-surface—such as leather, paper, or other suitable material—and the face of the driving-disk A will preferably be provided with a frictional contact-surface of a suitable aluminium alloy, preferably an alloy consisting of about nine-tenths aluminium to one-tenth zinc, which alloy I have found to produce a desirable frictional surface. As shown in the sectional view, Fig. 3, this frictional surface may be applied by forming a recess d in the face of the driving-disk A, preferably having undercut or beveled edges, into which recess d the friction-surface d' of the aluminium alloy referred to is poured in molten form and cast therein. This, it will be observed, forms a close union between the body of the disk A and its frictional driving-surface instead of using screws or other extraneous fastening devices for securing it thereto, which screws would be liable to work loose and to damage the surface of the driven wheel. It is of course understood that any other suitable means may be adopted for anchoring the frictional contact-face to the body of the driving-disk A instead of the undercut or beveled edges d, it being only desirable to form a permanent union without the necessity of using screws or other extraneous fastening means.

In the operation of my friction-gearing it will be observed that the driven wheel B can be moved across the face of the driving-disk A in the usual manner for the purpose of varying the speed or reversing the direction of rotation; but it is not necessary to move the driven wheel B away from and out of contact with the driving-disk A when it is desired to stop the movement of the machine without stopping the engine and that by simply moving the driven wheel B so that its periphery will be in axial alinement with the crank-shaft a and in contact with the floating rest C the driving-disk A can continue to rotate without imparting any rotation to the driven wheel B and there will be no liability of the rotations of the driving-disk A to wear flat places upon the driven wheel B, such as would occur were it not for the presence of the floating rest C.

Having described my invention, I claim as new and desire to protect by Letters Patent of the United States—

1. In power-transmitting mechanism, the combination with a friction driving-disk, of a driven wheel having its periphery arranged in contact with and driven by the driving-disk, a floating rest located at the center of the face of the driving-disk and comprising a plate fixed in a recess in said driving-disk and a cup-shaped plate having its flange engaging the fixed plate to turn with relation thereto and inclosing an antifriction-bearing, substantially as described.

2. In power-transmitting mechanism, the combination with a friction driving-disk, of a driven wheel having its periphery arranged in contact with and driven by the driving-disk, a floating rest located at the center of the face of the driving-disk and comprising a plate mounted in a recess in said driving-disk and free to turn therein, an antifriction-bearing supporting said plate and consisting of a plurality of rolling members arranged in circular form and a ring supporting said rolling members, substantially as described.

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

CHARLES B. HATFIELD.

Witnesses:

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MAY A. KENNEY.