No. 626,395.

Patented June 6, 1899.

C. C. RIOTTE.

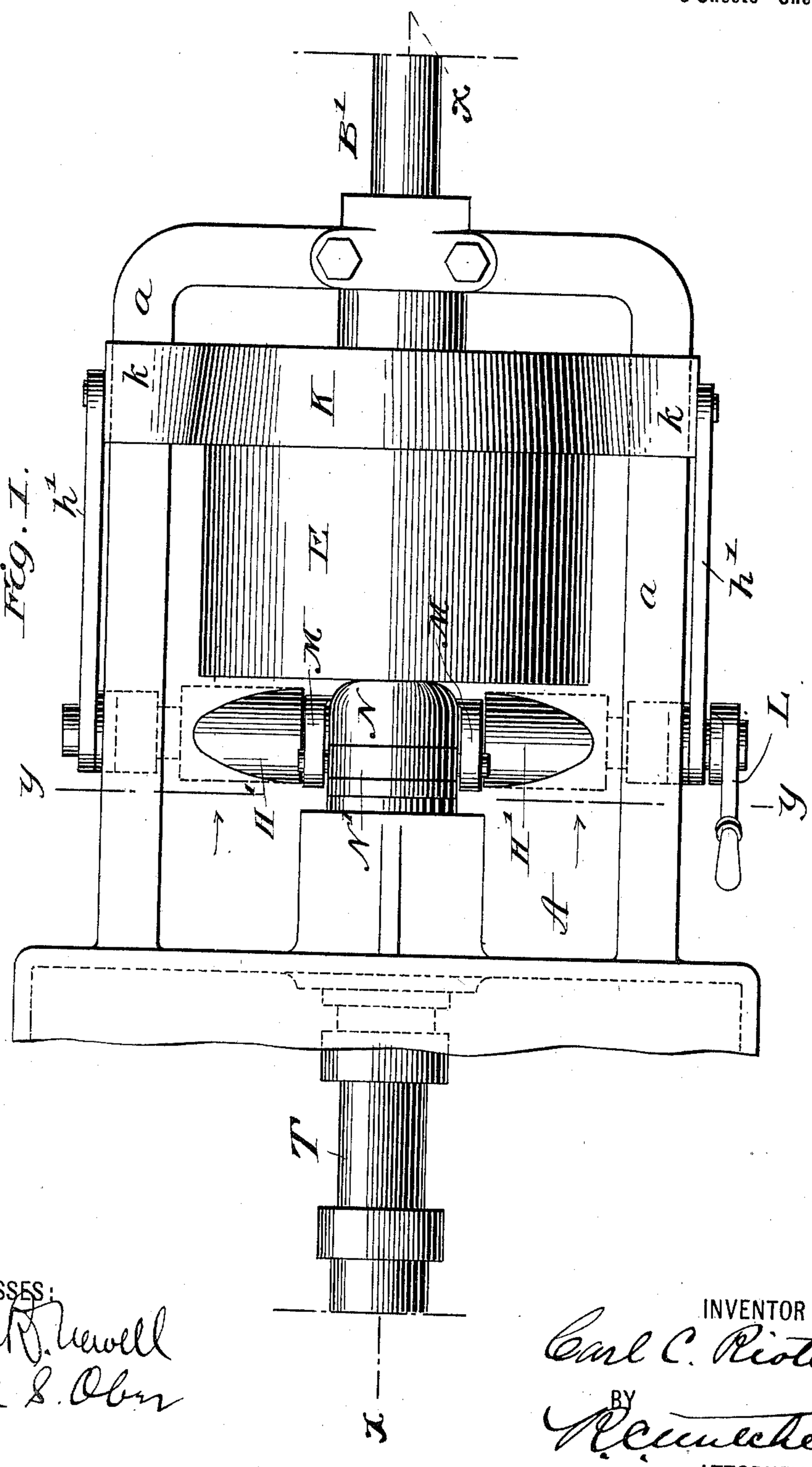
REVERSING GEAR.

(Application filed May 9, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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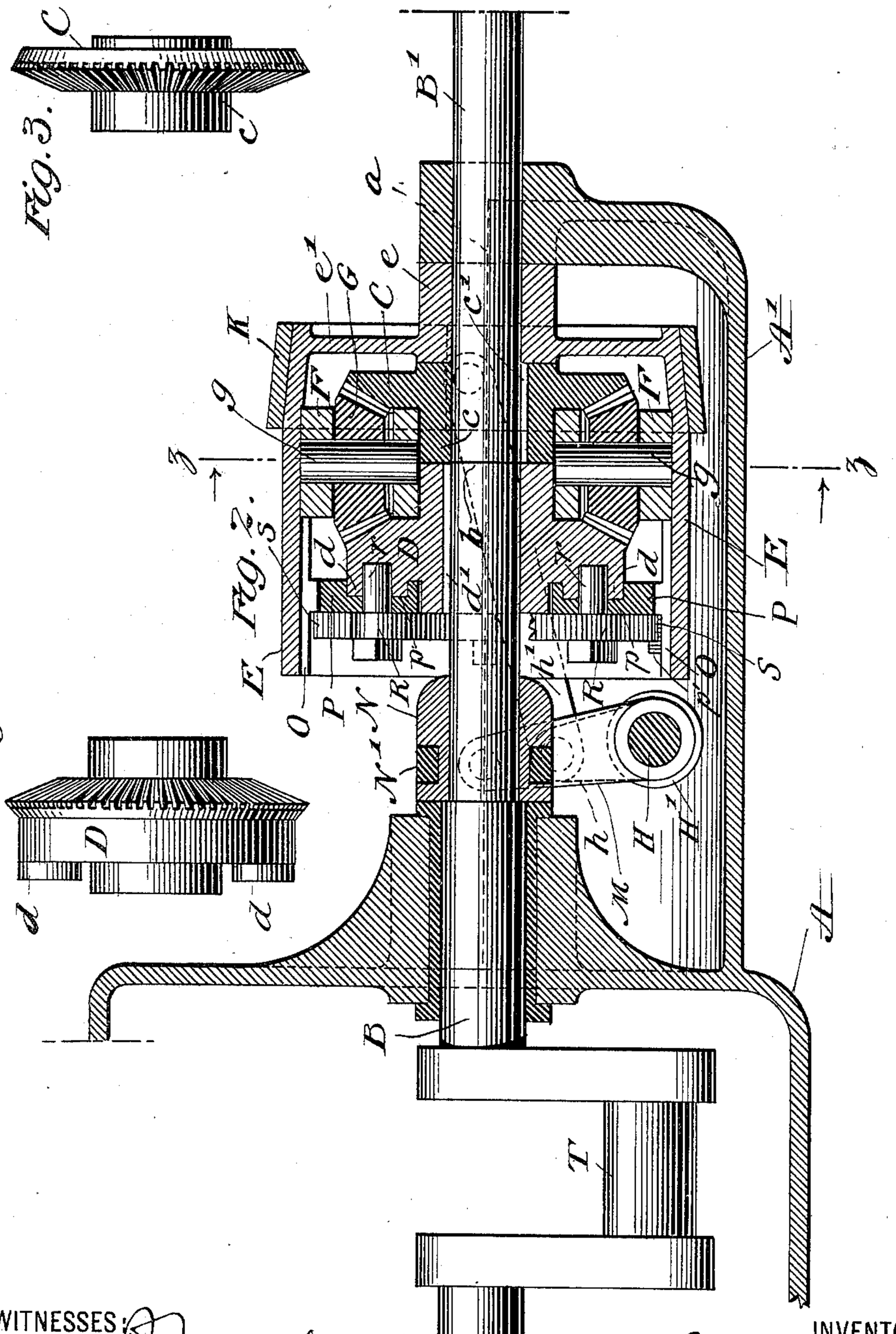
(No Model.) 3 Sheets—Sheet 2.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

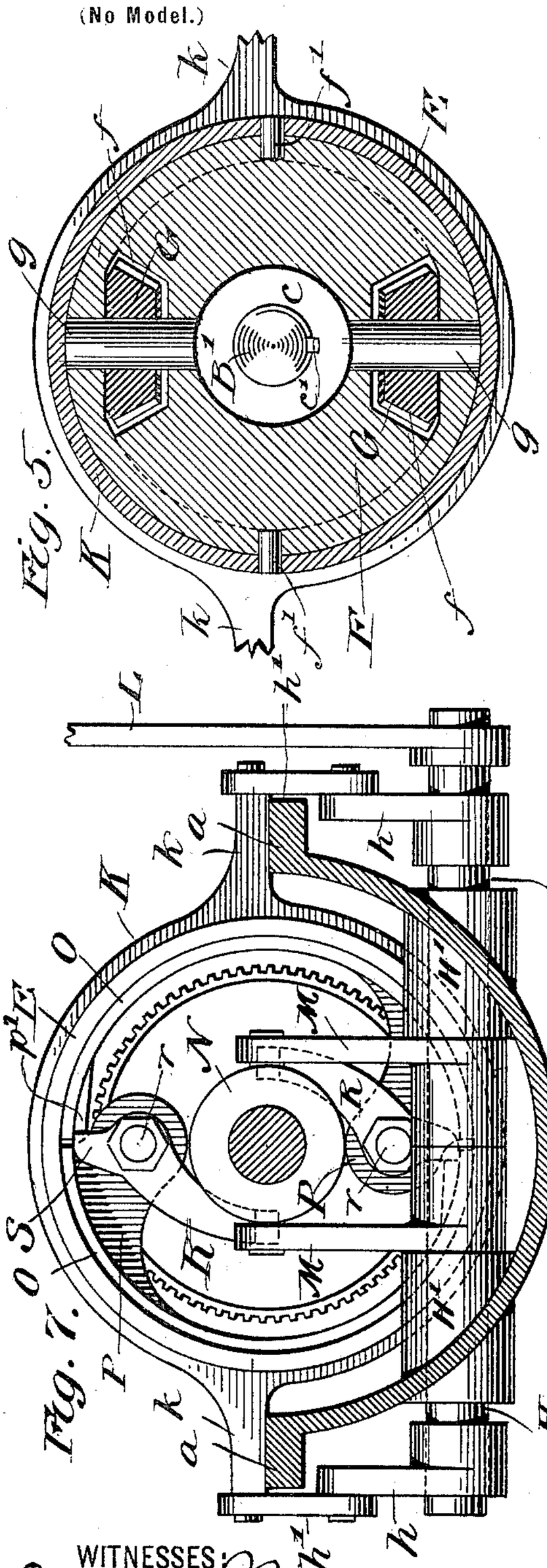


Fig. 6.

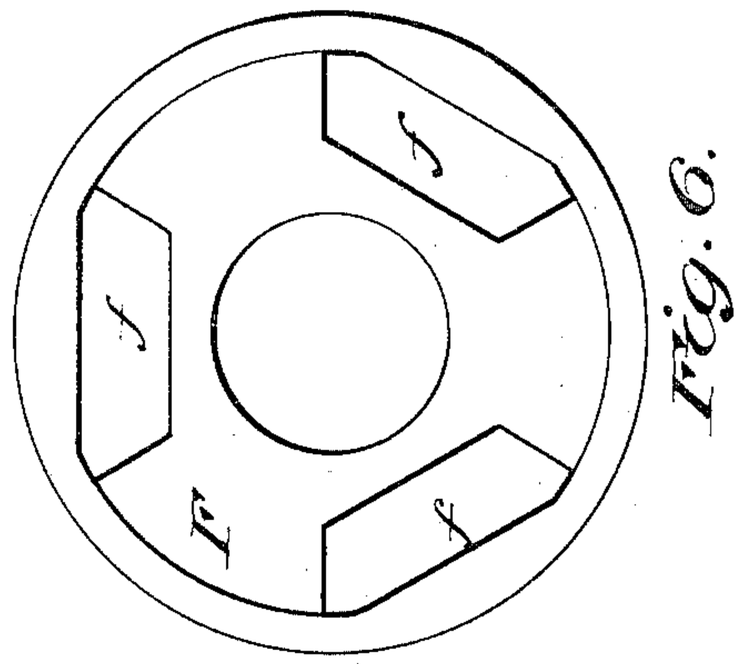
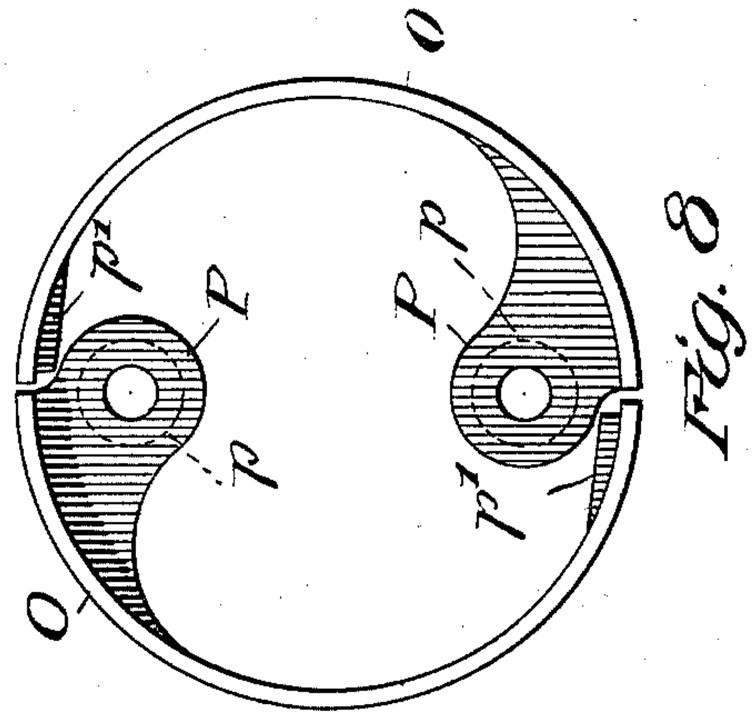


Fig. 7.

Fig. 8



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UNITED STATES PATENT OFFICE.

CARL C. RIOTTE, OF NEW YORK, N. Y., ASSIGNOR TO THE C. C. RIOTTE COMPANY, OF NEW YORK.

REVERSING-GEAR.

SPECIFICATION forming part of Letters Patent No. 626,395, dated June 6, 1899.

Application filed May 9, 1898. Serial No. 680,117. (No model.)

To all whom it may concern:

Be it known that I, CARL C. RIOTTE, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Reversing-Gears, of which the following is a full, clear, and exact description.

My invention relates to variable driving-gear for engines, and is especially adapted for use in operating a propeller where the motive power is supplied by an engine which it is desirable should always run in one direction; and my object is to provide means to variably drive any desired part and to accurately control the same. It is especially adapted for use in connection with gas-engines; but it will be obvious that it is not limited to any particular kind of engine or for any particular kind of work to be accomplished.

In the preferred embodiment of my construction, Figure 1 shows in a plan view my device as applied to the rear part of an engine. Fig. 2 shows a vertical sectional view on the line X X of Fig. 1. Figs. 3 and 4 show details of the beveled gears shown in Fig. 2. Fig. 5 shows a transverse vertical sectional view on the line Z Z of Fig. 2, looking in the direction of the arrows. Fig. 6 shows a modified construction of a part of the device shown in Fig. 5. Fig. 7 shows a transverse sectional view on the line Y Y of Fig. 1, looking in the direction of the arrows. Fig. 8 is a detail of one of the frictional clutch mechanisms.

In the construction shown, A is a broken-away view of part of the engine-casing or any other suitable support. A′ is a drip-pan, preferably attached thereto and supporting in suitable journals the driving-shaft B. This shaft is divided into two parts B and B′, as shown at *b*, and is driven by an engine, as at T, in any manner desired. The beveled gear-wheel D is keyed, as shown at *d*′, or otherwise fastened to the part B. To the part B′ is fastened by a key *c*′ or otherwise a beveled gear-wheel C, which has an extension *c* on the shaft.

E is a revoluble part, preferably in the form of a frame or casing to protect the mechanism, having a head *e*′ and a hub *e* fitting loosely on the shaft B′, so that the shaft may rotate independently of this casing.

F is a transverse head preferably of circular form and fitting the interior of the casing, to which it is attached by the pins *f*′. This head F has a plurality of perforations *f*, as shown in Figs. 5 and 6, and in such perforations are inserted the beveled gears G, pivotally held in place by the pins *g* and which mesh with the gear-wheels C and D. It will be observed that the extension *c* on the gear-wheel C and the corresponding extension on gear-wheel D enter a circular recess in the head F, and those parts of the head F and of said two gear-wheels which lie in vertical contact with the head F, as shown in Fig. 2, bear against each other, and as these gears are fixed to the shafts the head at these points takes up the end thrust of these shafts. Furthermore, in this construction the shafts are kept in alinement and partially supported at their ends by the extension *c* on gear-wheel C and the corresponding extension on gear-wheel D entering and fitting the circular hole in the transverse head F.

K is a clutch for holding from rotation or releasing the frame or casing E.

H is a rock-shaft actuated by a lever L and passing through journals H′ on the drip-pan and carrying arms *h h* rigidly fastened to it. The clutch K in this embodiment of my invention is preferably in the form of a rigid ring, as shown, and has lateral extensions *k*, which slide upon guideways *a* on the drip-pan. Links *h*′ are pivotally connected to these lateral extensions and also to the arms *h*, so as to throw the clutch K into and out of engagement with the casing E when the lever L is operated.

The gear-wheel D has lugs *d* projecting from one face of it, as shown.

O O constitute a second frictional clutch, preferably in the form of a split spring-ring, each section of which has an ear P and a lug *p*′. The ears P have recesses in them, which enable them to be fitted over and slightly rock upon the projections *d*, and they are movably held in place by pins *r*. The ring when in place is preferably of a size which just fits within the casing E.

R R are levers pivoted upon the pins *r* and having projections S S adapted to engage the lugs *p*′ *p*′ when said arms are thrown outward.

N is a cam for operating the arms R, loosely

mounted on the shaft B, so that it may be slid longitudinally thereon, and preferably having a groove *n*, in which is a collar N′.

M are levers fixed on the rocking rod H and engaging trunnions on the collar N′, as shown, to operate the cam.

When the parts are in the position shown in Figs. 1 and 2, the clutch K engages the casing E and prevents the same from rotating. The beveled wheel D rotates with the shaft B and communicates a rotary motion through the beveled gears G G to the gear-wheel C. The wheel C is fixed to the shaft B′, and said wheel and shaft will therefore be rotated at this time in the opposite direction from that of the wheel D and shaft B. If now it is desired to reverse the shaft B′, it is only necessary to throw over the lever L, which will rock the shaft H and arms M and *h*, throwing the clutch K out of engagement with the casing E and throwing the cam N into engagement with the arms R. As the arms R are engaged and moved by the cam, the projections S will be moved in the opposite direction and will engage the lugs *p′ p′*, and the diameter of the clutch will be increased as the parts O O are outwardly bent and will engage the inner surface of the casing E, which will then be carried along by the wheel D. As the beveled gears G are fixed relatively to the casing E, no rotary motion around their pivots can be given them as long as the clutch O tightly engages the casing E, and as they at all times mesh with the gear-wheel C said gear-wheel will be carried on in the same direction of rotation as that of the wheel D, thus reversing its former rotation.

It will be observed that by my construction the shaft B′ may be quickly rotated in either direction by a mere movement of the lever L and that this will be accomplished without any sudden shock or jar, as the clutches will come into action comparatively gradually, and therefore the cogs of the gear-wheels are not liable to become stripped or the parts in any way injured. The speed of the shaft B′ in either direction may be regulated by the intermediate positions of the two clutches, and when both clutches are out of engagement with the casing E said casing or gears, or both, will idly rotate and communicate no movement to the shaft B′. All movements of said shaft, either in speed or direction, may therefore be accurately controlled by the manipulation of the lever L.

Other advantages of my construction will appear, and it will be obvious that many changes may be made in the same without departing from the spirit of my invention.

What I claim is—

1. In combination a driving-shaft, an independent driven shaft, gears on each shaft, each of said gears having a bearing-face, an intermediate gearing, a head against which said bearing-faces rest and which is adapted to take up the end thrust of said shafts, and means to hold said intermediate gearing stationary with respect to the rotation of both of said shafts, or to lock it so as to be bodily rotatable with one of said shafts.

2. In combination a driving-shaft, an independent driven shaft, gears on each shaft, each of said gears having a bearing-face, a frame rotatable around said shafts and carrying intermediate gearing, a head against which said bearing-faces rest and which is adapted to take up the end thrust of said shafts, and means to hold said intermediate gearing stationary with respect to the rotation of both of said shafts, or to lock it so as to be bodily rotatable with one of said shafts.

3. In combination a driving-shaft, an independent driven shaft, gears on each of said shafts, an intermediate and transverse head forming a support for the ends of said shafts to keep the same in alinement and forming also spacing means to keep said gears on said shaft suitably apart, intermediate gearing carried by said head and adapted to connect said gears on said shafts, a brake to hold said head fixed with relation to the rotation of one of said shafts and a clutch to carry said head along with the same shaft.

4. In combination a driving-shaft, an independent driven shaft, gears on each shaft, each of said gears having a bearing-face and a projection, a frame rotatable around said shafts and carrying intermediate gearing and having a head against which said bearing-faces rest and which is adapted to take up the end thrust of said shafts, and means to hold said intermediate gearing stationary with respect to the rotation of both of said shafts or to lock it so as to be bodily rotatable with one of said shafts.

5. In combination a driving-shaft, an independent driven shaft, gears on each of said shafts, a cylindrical frame, an intermediate and transverse head carried by and adapted to be slipped into said frame and fastened therein and forming a support for the ends of said shafts to keep the same in alinement and forming also a spacing means to keep said gears on said shaft suitably apart, intermediate gearing carried in slots in said head and adapted to connect said gears on said shafts, a brake to hold said head fixed with relation to the rotation of one of said shafts, and a clutch to carry said head along with the same shaft, exerting a pressure thereon without tending substantially to push said shaft out of alinement.

Signed at New York, N. Y., this 15th day of April, 1898.

CARL C. RIOTTE.

Witnesses:
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R. C. MITCHELL.