No. 724,263. PATENTED MAR. 31, 1903.

C. J. COOK.

REVERSING MECHANISM.

APPLICATION FILED JULY 8, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

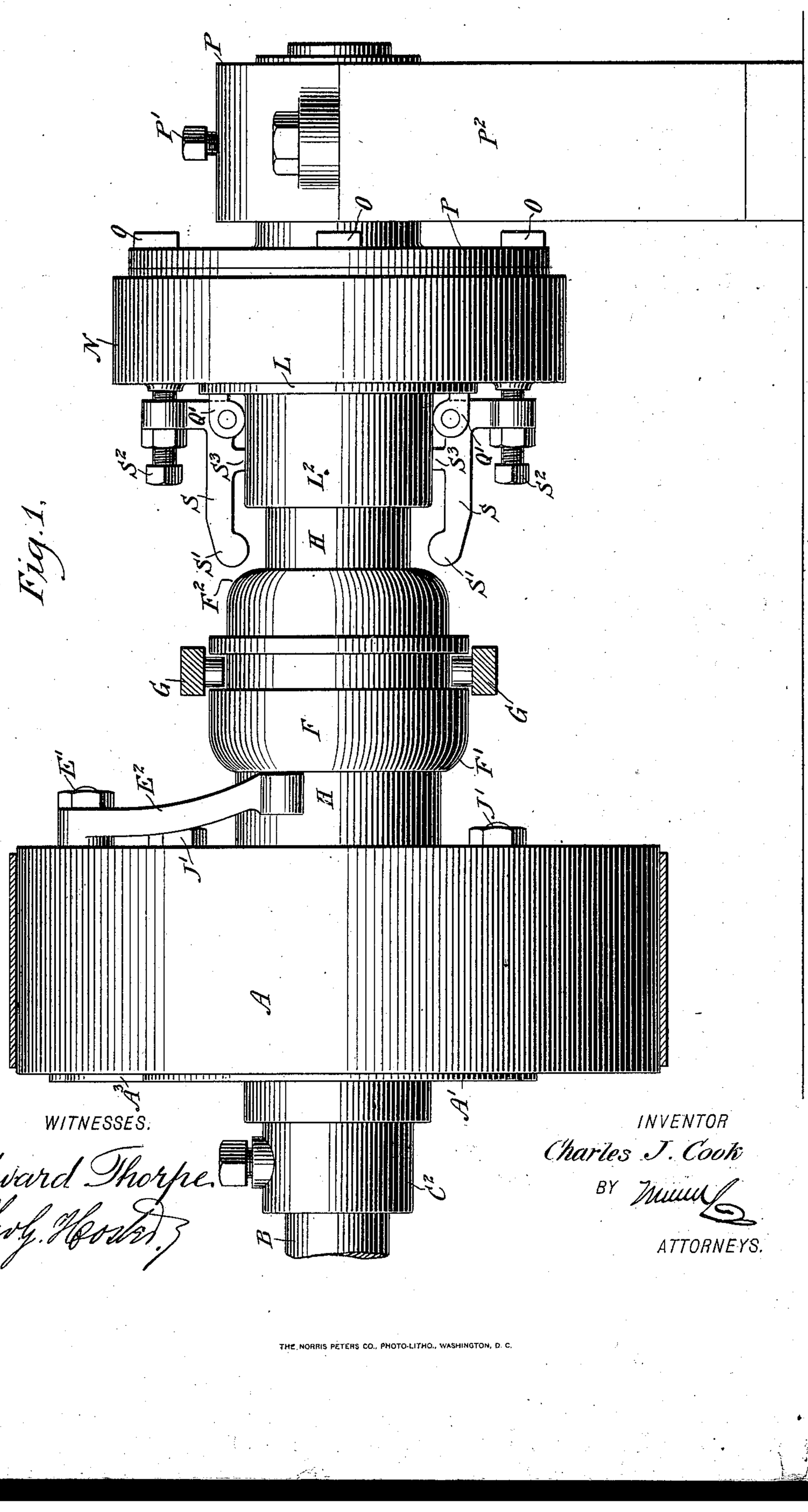

Fig. 1.

WITNESSES.

Edward Thorpe.

Percy. Hooker.

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ATTORNEYS.

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NO MODEL. 3 SHEETS—SHEET 2.

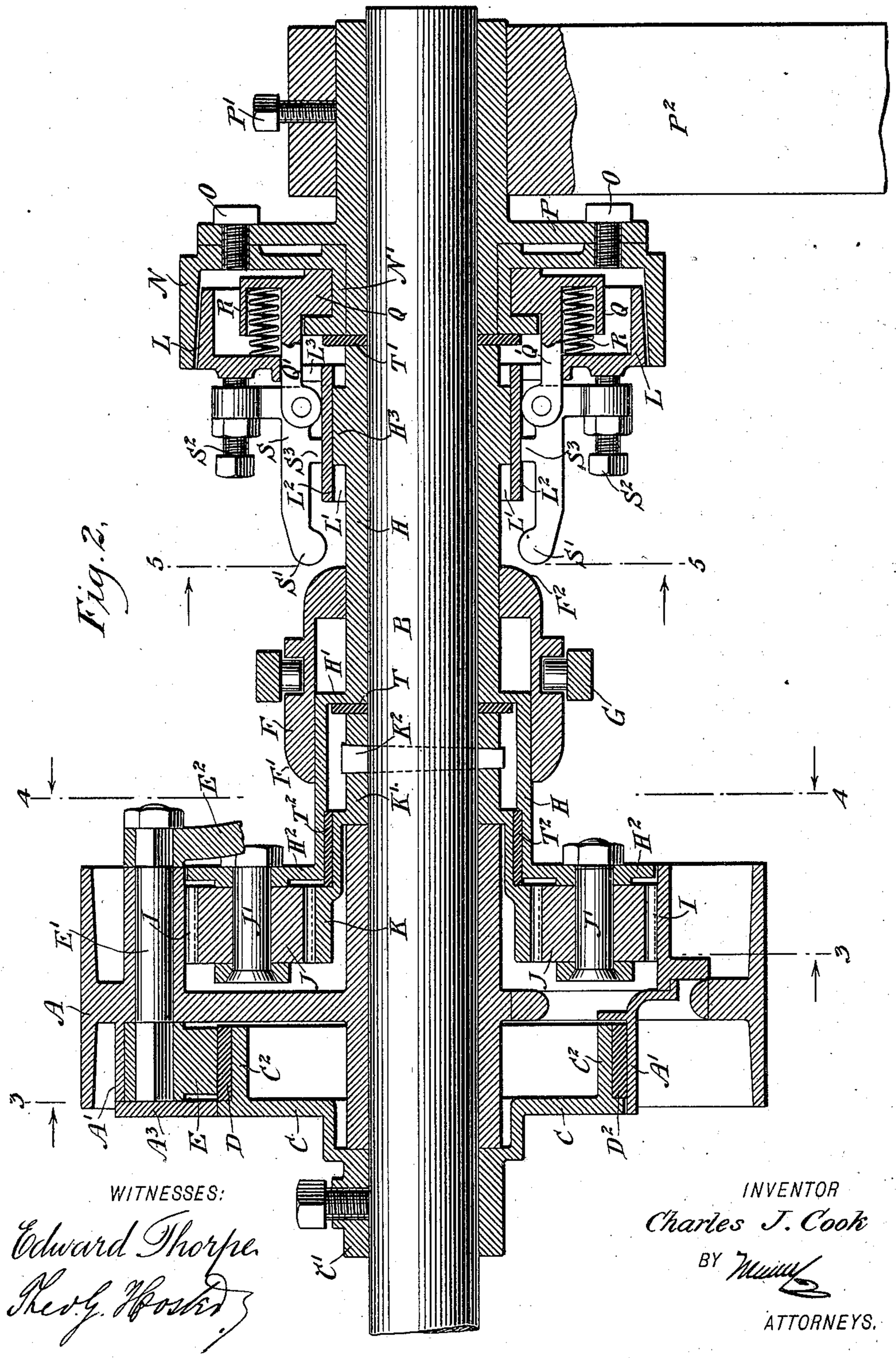

Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3,

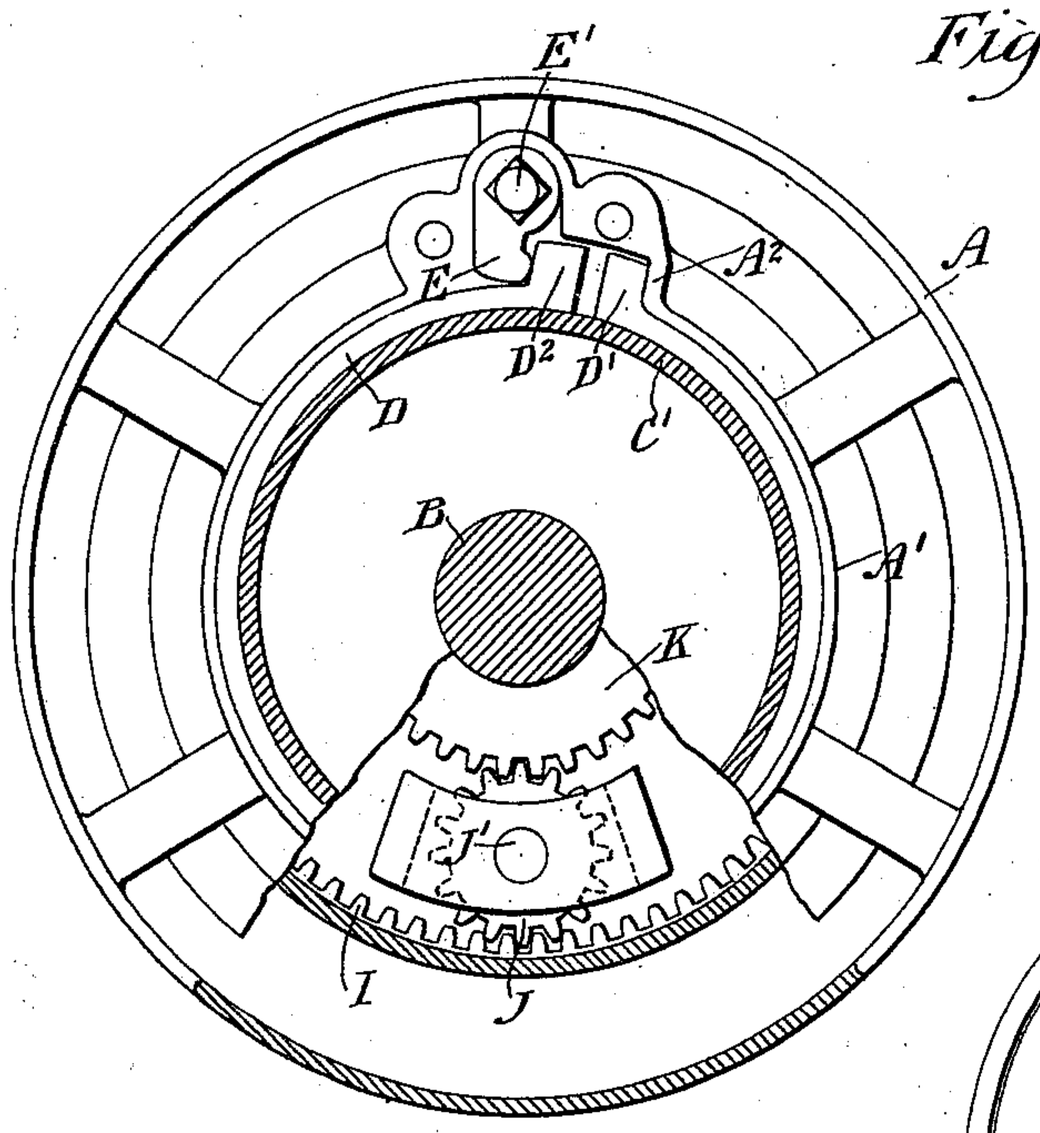


Fig. 5.

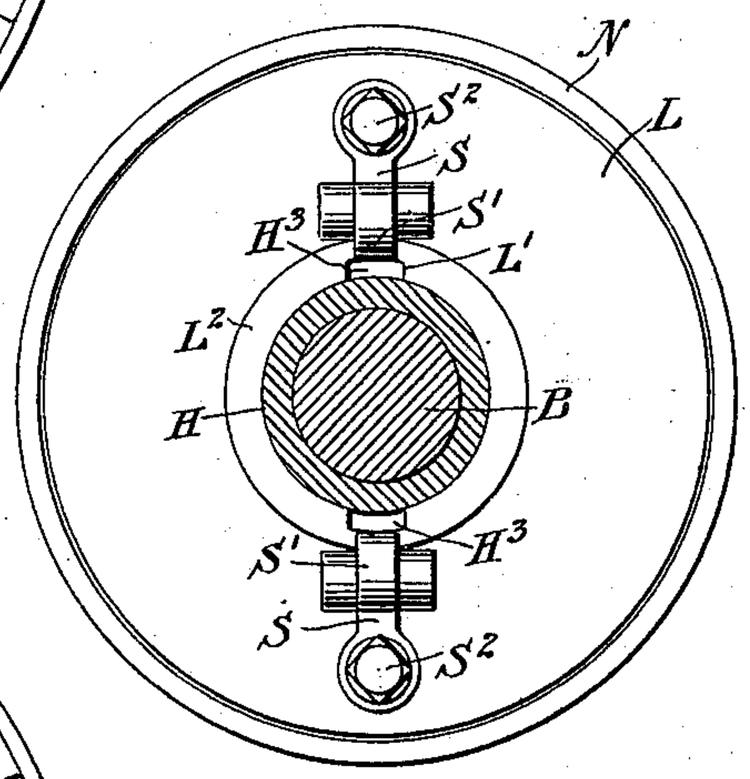
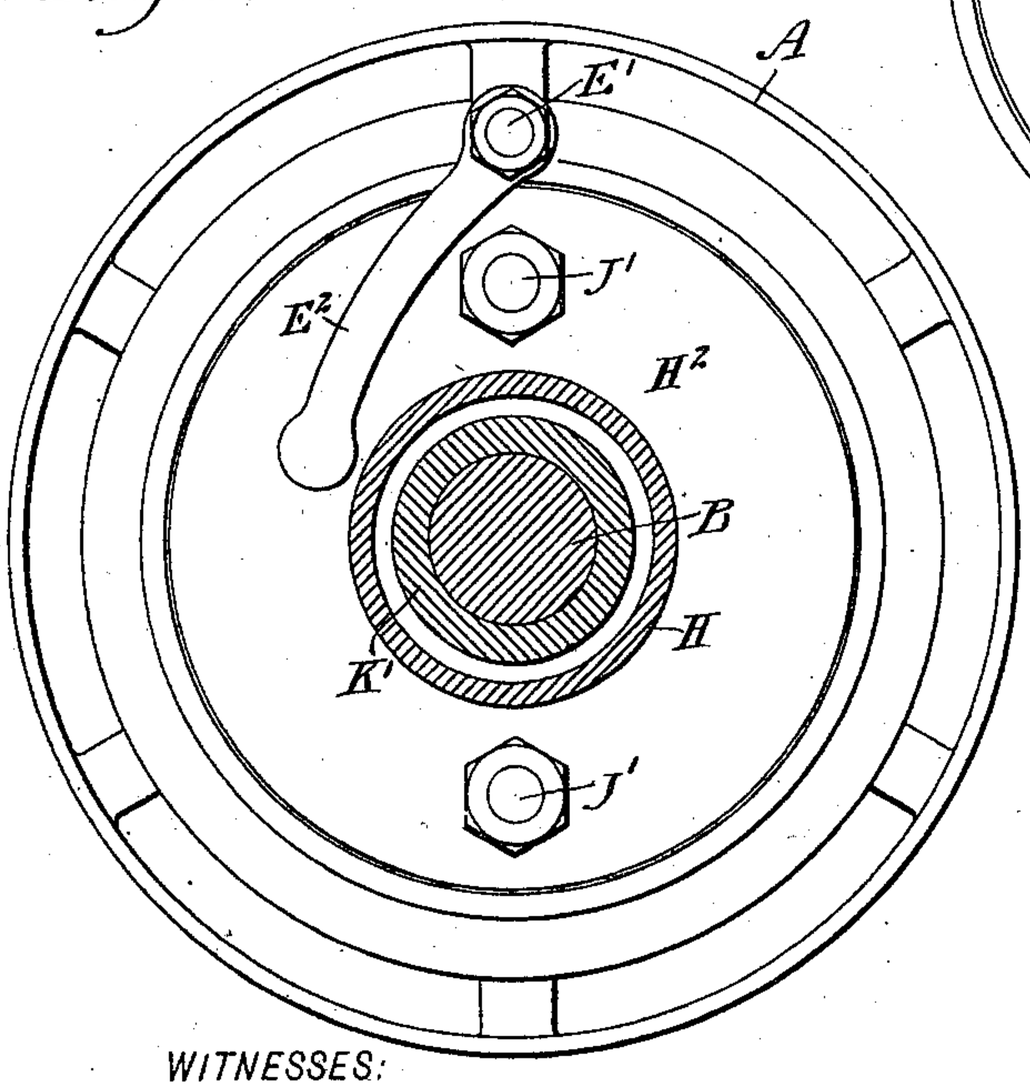


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES JOHN COOK, OF BROOKLYN, NEW YORK.

REVERSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 724,263, dated March 31, 1903.

Application filed July 8, 1902. Serial No. 114,710. (No model.)

To all whom it may concern:

Be it known that I, CHARLES JOHN COOK, a subject of the King of Great Britain, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Reversing Mechanism, of which the following is a full, clear, and exact description.

The invention relates to power transmission; and its object is to provide a new and improved reversing mechanism which is simple and durable in construction and arranged to permit the operator to reverse at any time to cause rotation of the member to be driven in either a forward or backward direction at the same time or an increased or diminished rate of speed.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied to a counter-shaft and pulley, parts being shown in section. Fig. 2 is a longitudinal sectional elevation of the same. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 2. Fig. 4 is a similar view of the same on the line 4 4 of Fig. 2, and Fig. 5 is a like view of the same on the line 5 5 of Fig. 2.

The pulley A, driven by belt or other means from suitable machinery, is mounted to rotate loosely on a shaft B to be driven, and on the said shaft B is secured the hub C′ of a friction-wheel C, having its rim C^2 engaged by a brake-band D, contained within a casing A′, forming part of the pulley A, as plainly illustrated in Figs. 2 and 3. One end of the brake-band D terminates in a lug D′, abutting against a shoulder A^2 in the said casing A′, (see Fig. 3,) and the other end of the brake-band is provided with a similar lug D^2, engaged by an arm E, secured on one end of a shaft E′ and extending longitudinally and journaled in suitable bearings carried by the pulley A. Thus when the shaft E′ is rocked in one direction it exerts pressure against the lug D^2, so as to close the brake-band tightly around the rim C^2 of the friction-wheel C to positively connect the pulley A by the brake-band D and friction-wheel C with the shaft B to rotate the same in unison with the pulley A.

The shaft E′, previously mentioned, is provided with an arm E^2, adapted to be engaged by the beveled end F′ of a shifting collar F, engaged by a shifting lever G, of usual construction and under the control of the operator, so as to impart a longitudinal sliding motion to the said shifting collar to cause its beveled end F′ to move in engagement with the free end of the arm E^2 to impart a rocking motion to the shaft E′ for tightening the brake-band on the rim C^2, as previously explained and for the purpose mentioned.

The friction-wheel C, brake-band D, and arm E are arranged on one side of the pulley A, while the arm E^2 and shifting collar F are located on the opposite side of the said pulley, as will be readily understood by reference to the drawings, the said shifting collar being mounted to slide loosely on a sleeve H, mounted to rotate loosely on the shaft B. The movement of the shifting collar F from the right to the left is limited by a shoulder H′ on the sleeve H.

The pulley A is provided with an internal gear-wheel I in mesh with one of a plurality of pinions J, mounted to rotate loosely on studs J′, held on a flange H^2, formed or secured on the sleeve H. The pinions J are also in mesh on opposite sides of the internal gear-wheel I with a gear-wheel K, having its hub K′ secured by a pin K^2 or other means to the shaft B, so that the gear-wheel K rotates with the said shaft B. Now when the pulley A is connected by the brake-band D and friction-wheel C with the shaft B then the pinions J are caused to travel bodily, so that the sleeve H is rotated loosely on the shaft B. When the friction-clutch, consisting of the brake-band D and friction-wheel C, is opened and the sleeve H is held stationary, then the rotary motion of the pulley A is transmitted by the gear-wheel I and pinions J to the gear-wheel K to rotate the shaft B in the reverse

direction to the pulley A and at a higher rate of speed. The gear-wheel I, pinions J, and gear-wheel K may be, however, proportioned different than shown to cause the rotation of the shaft B at a lower rate of speed than that of the pulley A.

Now in order to hold the sleeve H stationary I provide the following device: On the sleeve H to the right of the shifting collar F are formed lugs H^3, extending into a longitudinal groove L', formed on the inside of the hub L^2 of a friction-wheel L, having the peripheral surface of its rim beveled to engage a corresponding bevel in the surface of a wheel N, secured by bolts O to the bearing P, in which the shaft B rotates, the said bearing being secured by a set-screw P' or other means to a supporting-standard P^2. The stationary wheel N is provided on its hub with a bearing N', having a ring Q, containing recesses for springs R, pressing against the web of the friction-wheel L, so as to hold the latter normally out of frictional contact with the wheel N. The ring Q is also provided with arms Q', extending through openings L^3 in the web of the wheel L to the outside thereof, and on the outer ends of the said arms Q' are fulcrumed bell-crank levers S, each having its forward end S' rounded off to be engaged by the beveled end F^2 of the shifting collar F, previously mentioned. The vertical member of the bell-crank lever S carries a bolt S^2, engaging the web of the friction-wheel L, so that when the shifting collar F is moved from the left to the right then its end F^2 engages the ends S' of the bell-crank levers S to impart a swinging motion to the same, and thereby cause the bolts S^2 to push the friction-wheel L longitudinally against the tension of the springs R and in frictional contact with the wheel N to hold the wheel L stationary, and with it the sleeve H, as the lugs H^3 thereof engage the grooves L' in the hub L^2 of the wheel L. Now when the sleeve H is held stationary then the rotary motion of the pulley A is transferred to the shaft B by the gear-wheels I and K and pinions J, as before explained. When the operator moves the shifting collar F from the right to the left to disengage the end F^2 from the ends S' of the bell-crank levers S, then the springs R immediately return the friction-wheel L into an outward position—that is, move the said friction-wheel out of engagement with the stationary wheel N. The sleeve H is now again free to rotate loosely on the shaft B.

A friction-washer T is interposed between the right-hand end of the hub of the pulley A and the sleeve H, and a like washer extends between the sleeve and the hub of the fixed wheel N. (See Fig. 2.) A friction-washer T^2 is also interposed between the sleeve H and the hub K' of the gear-wheel K. A removable cap-plate A^3 on the casing A' permits access to the shaft E', arms E, and lugs D' D^2 of the brake-band D. The flange H^2 of the sleeve, besides carrying the studs J', forms a cover for inclosing the gear-wheels I and K and pinions J to prevent dust, &c., from clogging up the parts.

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

1. A reversing mechanism, comprising in combination a pulley, a shaft on which the pulley is mounted to rotate loosely, a sleeve loose on the shaft, a holding mechanism under the control of the operator, for holding the sleeve in a fixed position, intermediate pinions journaled on the sleeve, gear-wheels in mesh with the pinions, on opposite sides, one of the gear-wheels revolving with the shaft and the other with the pulley, a friction-clutch for directly connecting the pulley with the said shaft, to revolve the pulley and shaft in unison, and a shifting collar under the control of the operator, for actuating either the said friction-clutch or the said holding device, as set forth.

2. A reversing mechanism, comprising in combination a pulley, a shaft on which the pulley is mounted to rotate loosely, a sleeve loose on the said shaft, pinions journaled on the sleeve, gear-wheels in mesh with the pinions, on opposite sides, one of the gear-wheels revolving with the shaft and the other with the pulley, and a holding device for holding the said sleeve stationary, the said holding device comprising a fixed friction-wheel, a spring-pressed friction-wheel adapted to move in and out of mesh with the said fixed friction-wheel, the said second friction-wheel being mounted to turn on the said sleeve and to slide longitudinally thereon, a ring mounted to turn loosely on the said fixed wheel and supporting-springs for pressing the second friction-wheel, and bell-crank levers fulcrumed on the said ring, for pressing the second friction-wheel in contact with the fixed friction-wheel and against the tension of the springs, the said bell-crank levers being controlled by the shifting collar, as set forth.

3. In a reversing mechanism, a shaft, a pulley loosely mounted on the shaft, a friction-wheel secured to the shaft, a brake-band engaging the friction-wheel, a rock-shaft carried by the pulley, means for operating the brake-band from said shaft, and means under the control of the operator for operating the rock-shaft, as set forth.

4. In a reversing mechanism, a shaft, a pulley loosely mounted on the shaft, a friction-wheel secured to the shaft, a brake-band engaging the friction-wheel, the brake-band having one end stationarily held and provided with a lug at its other end, a rock-shaft carried by the pulley and provided with an arm engaging the lug of the brake-band, and means for operating the rock-shaft, as set forth.

5. In a reversing mechanism, a shaft, a pulley loosely mounted on the shaft, a friction-wheel secured to the shaft, a brake-band en-

gaging the friction-wheel, the brake-band having one end stationarily held and provided at its other end with a lug, a rock-shaft carried by the pulley and provided with arms, one of which engages the lug of the brake-band, and a shifting collar for engaging the other arm of said shaft to rock the same, as set forth.

6. In a reversing mechanism, a shaft, a pulley loose on the shaft, a clutch for locking the pulley to the shaft, a sleeve loose on the shaft, gearing for connecting the pulley, shaft and sleeve with each other, and a clutch for locking the sleeve stationary, said clutch having its movable member mounted to turn with but to slide on the said sleeve, as set forth.

7. In a reversing mechanism, a shaft, a pulley loose on the shaft, a clutch for locking the pulley to the shaft, a sleeve loose on the shaft, gearing for connecting the shaft, pulley and sleeve with each other, a clutch for locking the sleeve stationary, said clutch having its movable member mounted to turn with but to slide on the said sleeve, and a shifting collar mounted on the sleeve for alternately operating the said clutches, as set forth.

8. In a reversing mechanism, a shaft, a pulley loose on the shaft, a clutch for locking the pulley to the shaft, a sleeve loose on the shaft, gearing for connecting the shaft, pulley and sleeve with each other, a friction-clutch for locking the sleeve stationary, said clutch comprising a fixed member and a movable member mounted to slide on but to turn with the said sleeve, and means between the pulley and the last-named clutch for alternately operating the said clutches, as set forth.

9. In a reversing mechanism, a shaft, a pulley loose on the shaft, a clutch for locking the pulley to the shaft, a sleeve loose on the shaft, gearing for connecting the pulley, shaft and sleeve with each other, a clutch for locking the sleeve stationary, and a shifting collar mounted on the sleeve, and alternately operating said clutches, as set forth.

10. In a reversing mechanism, a shaft, a pulley loose on the shaft, a friction-clutch for locking the pulley to the shaft, a sleeve loose on the shaft, gearing for connecting the pulley, shaft and sleeve with each other, a friction-clutch for locking the sleeve stationary, a shifting collar on the sleeve, and means for alternately operating the clutches from the said collar, as set forth.

11. In a reversing mechanism, a shaft, a pulley loose on the shaft, a clutch for locking the pulley to the shaft, provided with an operating-arm, a sleeve loose on the shaft, gearing for connecting the pulley, shaft and sleeve with each other, a clutch for locking the sleeve stationary and provided with an operating-arm, and a shifting collar mounted on the sleeve and having beveled ends adapted to alternately engage the arms of the clutches, as set forth.

12. In a reversing mechanism, a shaft, a pulley loose thereon, a clutch for locking the pulley to the shaft, a sleeve loose on the shaft, gearing for connecting the pulley, shaft and sleeve with each other, a shifting collar on the sleeve for operating the clutch, and a friction-clutch for locking the sleeve stationary, said clutch comprising a spring-pressed friction-wheel mounted to turn with and slide on the sleeve, a stationary wheel with which the friction-wheel engages, and an operating-lever adapted to be engaged by the shifting collar, as set forth.

13. In a reversing mechanism, a shaft, a pulley loose on the shaft, a clutch for locking the pulley to the shaft, a shaft for operating the clutch provided with an arm at one end, a sleeve loose on the shaft, gearing for connecting the pulley, shaft and sleeve with each other, a friction-clutch for locking the sleeve stationary and comprising a spring-pressed friction-wheel mounted to turn with and to slide on the sleeve, a stationary wheel with which the friction-wheel engages, an elbow-lever carried by the stationary wheel and adapted to operate with one of its members the friction-wheel, and a shifting collar on the sleeve and having its ends beveled, said collar being adapted to alternately engage the arm of the clutch-operating shaft and the elbow-lever, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES JOHN COOK.

Witnesses:
WILLIAM HENRY FENLON,
FREDRICK COOK ZINDELL.