

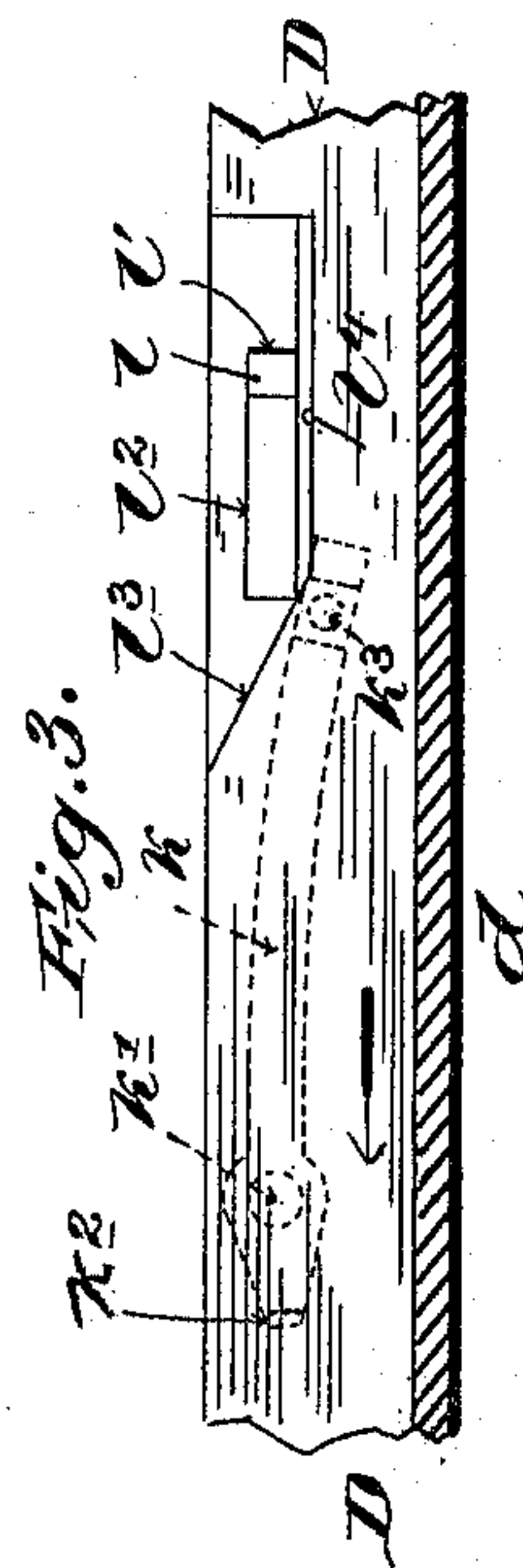
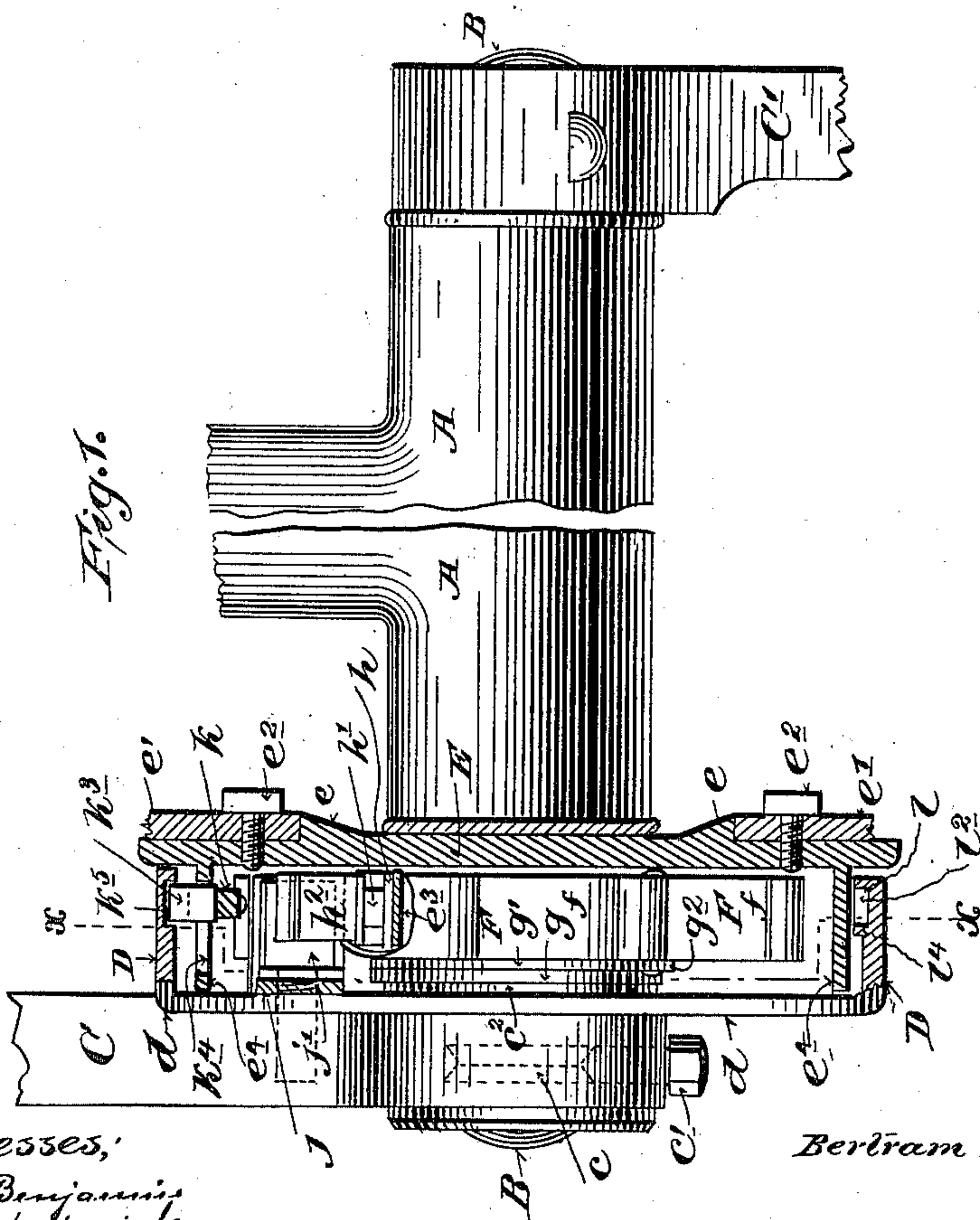
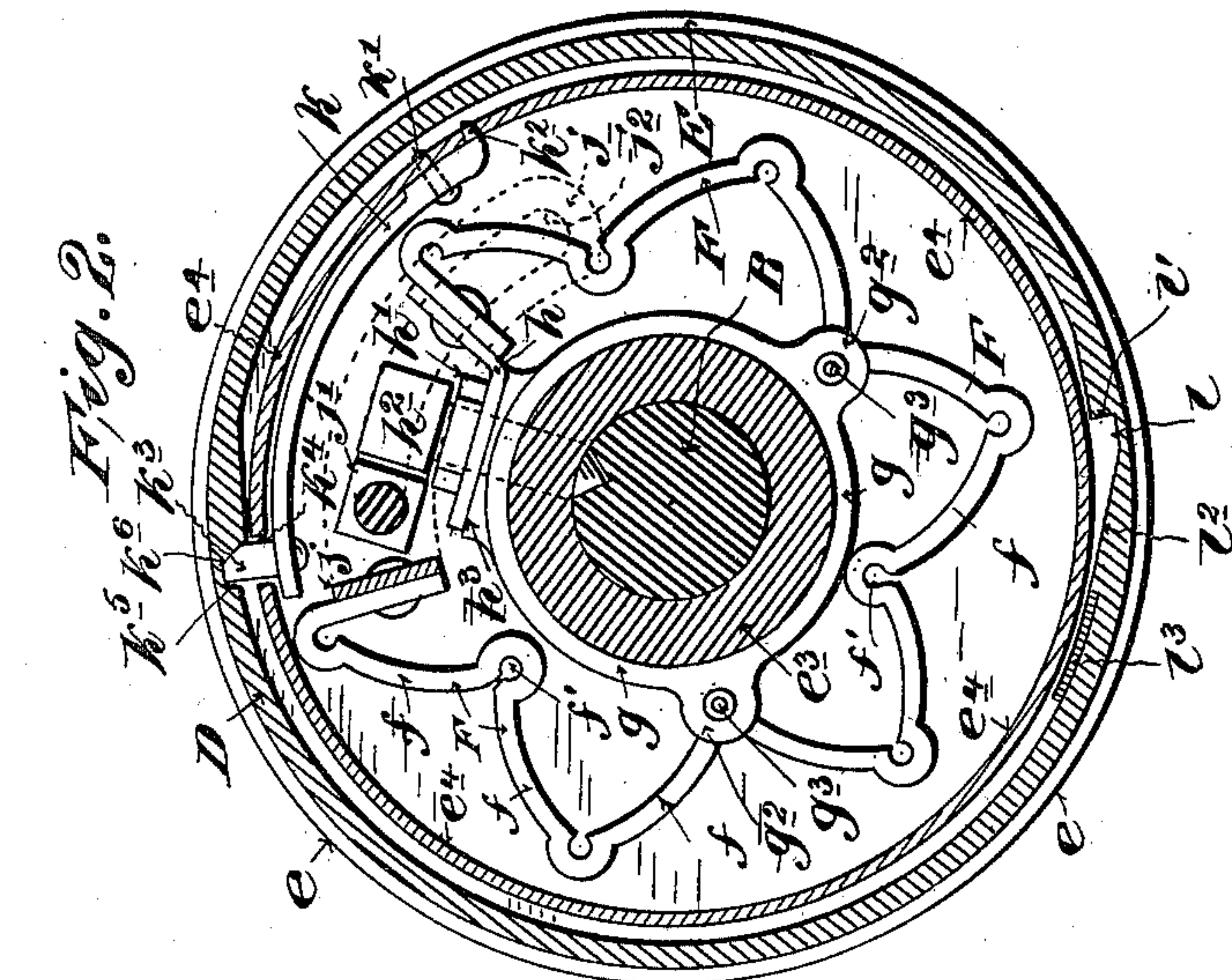
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B. R. AVERY.
DRIVING GEAR FOR CYCLES OR THE LIKE.

APPLICATION FILED JUNE 28, 1902.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

BERTRAM RICHARD AVERY, OF JOHANNESBURG, TRANSVAAL, SOUTH AFRICA.

DRIVING-GEAR FOR CYCLES OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 719,417, dated February 3, 1903.

Application filed June 28, 1902. Serial No. 113,655. (No model.)

To all whom it may concern:

Be it known that I, BERTRAM RICHARD AVERY, a subject of the King of Great Britain, residing at Johannesburg, Transvaal, South Africa, have invented certain new and useful Improvements Relating to the Driving-Gear of Cycles or the Like, of which the following is a specification.

This invention relates to the driving-gear for bicycles, tricycles, and other similar vehicles in which the driving-wheel is free to revolve while the cranks and their connections remain stationary, commonly known as a "free wheel." In this free-wheel driving-gear as heretofore constructed both cranks have been fixed to the crank-spindle in the ordinary way, and as a result of this arrangement of the cranks a feeling of instability is engendered and the rider is placed in an uncomfortable position when riding without pedaling.

My invention is designed to enable the rider to sit more firmly and comfortably on the cycle and to assume a more elegant position, particularly in the case of a lady rider, when not pedaling. It also enables a back-pedaling brake to be more readily controlled or operated and the machine to be more easily balanced, thereby avoiding undue wear and tear.

It consists, essentially, in constructing the driving-gear so that the pedals affixed to both cranks may be brought to the same level or into the same position relative to the crank-spindle or bottom bracket to afford a firm rest for the feet of the rider when the cranks are stationary.

The invention will be easily understood on reference to the accompanying drawings, wherein sufficient of the driving-gear is shown to clearly illustrate the embodiment of my invention.

In the drawings, Figure 1 is a part-sectional elevation; Fig. 2, a sectional elevation of Fig. 1 on line xx . Fig. 3 is a plan of the mortise or slot l , formed on the inside of the outer flange D .

A designates the bottom bracket, and B the crank-spindle arranged therein. The bracket and spindle may be fitted with the ordinary ball-bearings or any other suitable construc-

tion of bearing, as may be preferred. C C' are the two cranks. The crank C' is keyed or otherwise fixed on one extremity of the spindle B . The other crank C is loosely mounted on the opposite extremity of the crank-spindle B . The end of the spindle contained within the crank C is formed with an annular groove c , and a set-screw c' is screwed through the crank into engagement with the groove c , thereby retaining the crank in position while permitting it to revolve around or partially around the spindle B . The crank C is constructed on the inside with a disk d , formed with an annular projection or flange D , concentric with the crank-spindle B .

E is the sprocket-wheel, arranged on the crank-spindle B between the free crank C and the bottom bracket A . This sprocket-wheel may be of any ordinary or suitable construction. It is shown comprising a center piece e and an outer portion e' , on which are formed the sprockets or teeth, fixed to the center piece e by means of the screws or studs e^2 . The sprocket-wheel center e on that side next the crank C is formed with a boss e^3 .

On the sprocket-wheel center e , around the boss e^3 , is formed an annular projection or flange e^4 , which telescopes into the cylindrical projection or flange D , formed on the free crank C . This forms an inclosed annular chamber between the crank C and the sprocket-wheel E . In this chamber and around the boss e^3 is arranged a collapsible spring F . The spring F , which is concentrically disposed around the boss e^3 of the sprocket-wheel E , is, as is clearly shown in Fig. 2, constructed of a number of leaves f , which when the spring is placed in compression fold upon or against one another on their inner points f' . To act as a guide for the several sections or leaves of the spring F , two loose rings g and g' are fitted on and free to rotate around the boss or center c^2 of the crank C or on the boss e^3 of the sprocket-wheel E . The rings g and g' are each formed with a peripheral lug or projection g^2 , by which they are connected with the inner ends of alternate sections of the leaves f of the spring F by means of the pins g^3 . This arrangement insures the spring collapsing around the boss e^3 of the sprocket-wheel E and prevents the sections

bulging outward when the spring is compressed. One extremity of the spring F is fixed to the boss e^3 of the sprocket-wheel E by means of an angle-plate or bracket h , which is securely held in position by means of a nut h' on the set-screw or stud h^2 . The stud h^2 is screwed through the boss into engagement with a hole or recess formed in the crank-spindle B and the sprocket-wheel there-
 10 by fixed to the crank-spindle. When the sprocket-wheel E has been fixed to the crank-spindle B by the stud h^2 , the nut h' is then tightened to fix the bracket h to the boss e^3 . The boss is shown formed with a flat h^3 , on
 15 which the bracket h rests when in position. The other extremity of the spring F is connected with the free crank C by means of an angle-piece or bracket j . The bracket j is fixed to the crank by means of the set-screw
 20 or stud j' . It is shown (see Fig. 2) formed with a radial slot j^2 to permit of any required adjustment of the spring F. The set-screw or stud h^2 is arranged so as to engage the set-screw or stud j' when the cranks are in their
 25 normal positions, as shown in the drawings, and they constitute the means whereby the crank C is locked to the sprocket-wheel E to drive or propel the cycle.

On the inside of the flange e^4 of the sprocket-wheel E a spring-catch k is fixed, adapted to lock the flanges D and e^4 together, first, when the cranks are in their normal positions and also when the free crank C is brought opposite or into a position level or
 30 approximately level with the fixed crank C'. This catch comprises a flat spring k , fixed to the inside of the flange e^4 by means of the pin or rivet k' . On the end or tail of the spring k a projection k^2 is formed, which enters a slot or hole formed in the inner flange
 40 e^4 to prevent the spring turning bodily on the pin k' . In the other and free end of the spring k is fixed a stud or pin k^3 , which, as seen in Fig. 2, projects through a transverse slot k^4 , formed in the inner flange e^4 of the
 45 sprocket-wheel E, and drops into engagement with a coincident hole k^5 , formed in the flange D of the free crank C. The stud or pin k^3 is beveled off on one side, as seen at k^6 , and the
 50 hole k^5 in the outer flange D is formed with a corresponding bevel on one side, so that when the free crank C is turned backward and the other crank held stationary the stud k^3 slides out of engagement with the hole k^5
 55 in the outer flange D. This arrangement tends to maintain the free crank C in the driving position until forcibly released and prevents any play or looseness between the free crank C and sprocket-wheel E.

60 In Fig. 3 the means for temporarily locking the free crank C when it is brought into the same position as the fixed crank C' relative to the crank-spindle B are illustrated. In the interior of the outer flange D, diametrically opposite the hole k^5 , is formed a mortise or slot l , forming a ledge or projection l' , which is engaged by the stud k^3 of the spring-

catch k . In front of this ledge or projection l' an incline or inclined surface l^2 is formed, up which the stud k^3 rides when the parts
 70 are operated to bring the stud k^3 out of engagement with the ledge l' of the mortise l . Beyond the incline l^2 is a further ledge or ridge l^3 , inclined inward or toward the center of the flange, which operates, as shown in Fig. 3,
 75 when the stud k^3 drops into engagement with it to direct the free end of the spring inward until the stud k^3 comes in contact with a rib l^4 , which carries the stud k^3 beyond or clear
 80 of the mortise l , and thereby permits the free crank C to be returned to its normal position by the spring F.

In bringing the pedals C C' to the same position relative to the spindle B the action of the mechanism may be described as follows:
 85 Assuming that both cranks are in their normal or driving positions, as shown in the drawings, the fixed crank C' is held stationary and the free crank C rotated backward. This movement rotates the outer flange D,
 90 which forces the stud k^3 of the spring-catch k up the beveled edge k^6 out of the hole k^5 in the outer flange D. The set-screw j' is also carried backward out of contact with the set-screw h^2 and the spring F thereby collapsed
 95 and compressed around the boss e^3 of the sprocket-wheel E. When the crank C is brought opposite or in line with the crank C' or into the same position relative to the bottom bracket A, the stud k^3 of the spring-catch
 100 k drops into engagement with the mortise or slot l , engages the ledge l' , and thereby locks the free crank C to the sprocket-wheel E, crank-spindle B, and fixed crank C'. Instead
 105 of moving the free crank C backward the free crank C' may be held stationary and the fixed crank C', and with it the crank-spindle B and sprocket-wheel E, be moved forward half a revolution to bring the cranks into the same
 110 positions relative to the bottom bracket A. When it is desired to return the free crank C to its normal position, it is pushed slightly forward and the fixed crank held stationary,
 (or the fixed crank moved slightly backward and the loose crank kept stationary,) which
 115 movement causes the stud k^3 of the spring-catch k to ride up the incline l^2 and to drop into engagement with the ridge l^3 . The ridge l^3 directs the stud k^3 inward until it engages
 120 the rib l^4 , which rib carries the stud clear of the mortise l , and thereby allows the spring F to return the free crank C to its normal or driving position.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. A free-wheel driving-gear for cycles and the like in which one of the cranks is loosely mounted on the crank-spindle so that it may be turned backward or the fixed crank turned forward half a revolution to bring the cranks
 130 into the same relative position to the crank-spindle to place the pedals level, means for locking the loose crank to the spindle at each end of its movement, and means for unlock-

ing it when said crank is to be returned to its normal position, for the purposes specified.

2. In a free-wheel driving-gear for cycles and the like, the combination with the crank-spindle of a crank fixed on one extremity thereof, and a crank loosely mounted on the other extremity, a sprocket-wheel fixed on the crank-spindle, means for locking the free crank to the sprocket-wheel when in the normal or driving position, and a spring connected with the sprocket-wheel and the free crank which is compressed when the cranks are brought into the same position relative to the bottom bracket, and acts when released to return the free crank to normal or driving position, substantially as described.

3. In a free-wheel driving-gear for cycles and the like the combination with the crank-spindle and the crank fixed on one end thereof, of a crank loosely mounted on the other end, a sprocket-wheel fixed on the crank-spindle, a spring disposed around the crank-spindle, fixed at one extremity to the free crank and at the other extremity to the sprocket-wheel for returning the free crank to the driving position when released and maintaining it in that position, and means for locking the free crank to the sprocket-wheel and fixed crank when it has been operated to bring the pedals affixed to both cranks into the same position relative to the crank-spindle, substantially as and for the purposes described.

4. In a free-wheel driving-gear for cycles and the like, in combination, the crank-spindle B, the fixed crank C' on one end thereof, the free crank C on the other end thereof, the sprocket-wheel E the concentric collapsible spring F adjustably fixed at one extremity to the free crank and at the other to the sprocket-wheel, the loose rings *g* and *g'* for guiding the spring as it is compressed, and a spring-catch adapted to lock the free crank to the sprocket-wheel when the cranks are operated to bring the pedals level, substantially as and for the purposes described.

5. In combination, in a free-wheel driving-gear for cycles and the like, the crank-spindle B, the fixed crank C', the free crank C, the annular flange D of the crank C, the sprocket-wheel E, the concentric collapsible spring F adjustably attached at one end to the crank C and at the other end to the sprocket-wheel E, the annular flange *e*⁴ of the sprocket-wheel fitting into the flange D of the crank C, the spring-catch *k* attached to the inner flange *e*⁴ and the mortise *l* to be engaged by the spring-catch to lock the cranks together when they are brought into the same position relative to the crank-spindle, substantially as and for the purposes described.

6. In a driving-gear for cycles and the like,

the combination with the free crank C and the annular flange D thereof, of the sprocket-wheel E and the annular flange *e*⁴ telescoping into the flange D, the spring-catch *k* and the pin or stud *k*³, the mortise *l* in the interior of the outer flange forming a ledge *l'* to be engaged by the pin *k*³ to lock the cranks together when the pedals are level, the incline *l*² and the ridge *l*³ and rib *l*⁴ to direct the pin *k*³ out of engagement with the mortise *l* when the mechanism is operated to return the free crank to its normal position, substantially as described.

7. In a driving-gear for cycles and the like, the combination with the crank-spindle B of the fixed crank C' attached to one end thereof, the annular groove *c* in the other end of the crank-spindle, the loose crank C and the set-screw *c'* screwed through the crank into engagement with the groove *c*, the disk *d* of the crank C, and its annular flange D, the sprocket-wheel E and its boss *e*³ and concentric annular flange *e*⁴ forming a closed compartment with the flange D, the collapsible spring F comprising the several folding leaves *f* the loose rings *g* and *g'* connected with the inner ends of the leaves *f* of the springs to compel the spring to collapse around the boss *e*³, the adjustable bracket *j* and the stud *j'* fixing one end of the spring to the crank C, the stud *h*² fixing the sprocket-wheel E to the crank-spindle B, the studs *h*² and *j'* being arranged to engage each other to form the driving connection between the free crank and the sprocket-wheel when in the driving position, the bracket *h* and the nut *h'* on the stud *h*² fixing the other extremity of the spring F to the boss *e*³ of the sprocket-wheel E, the projection *k*² on the end thereof, the pin or stud *k*³ of the spring, the slot *k*⁴ in the inner flange through which the pin *k*³ projects, the hole *k*⁵ in the outer flange to be engaged by the pin *k*³ when the cranks are in normal position, the mortise *l* in the outer flange D forming the ledge *l'* with which the pin *k*³ engages to lock the cranks when they are brought into the same position relative to the crank-spindle B, the incline *l*² in front of the ledge *l'*, the ridge *l*³ beyond the incline and the rib *l*⁴ for directing the pin *k*³ clear of the mortise *l* when the crank is moved to return it to the normal or driving position, substantially as and for the purposes described and shown.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BERTRAM RICHARD AVERY.

Witnesses:

H. C. BEHR,

CHAS. OVENDALE.