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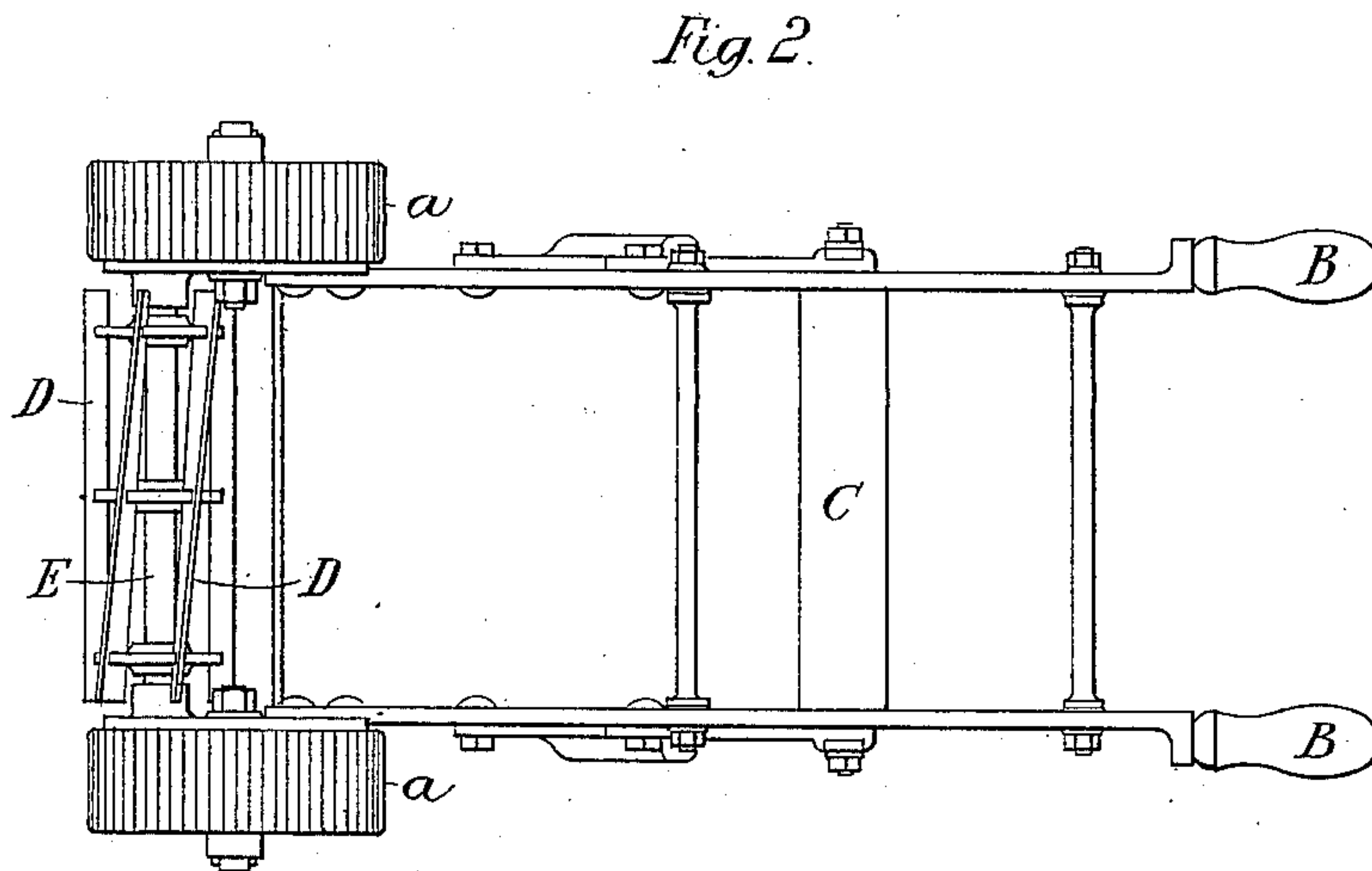
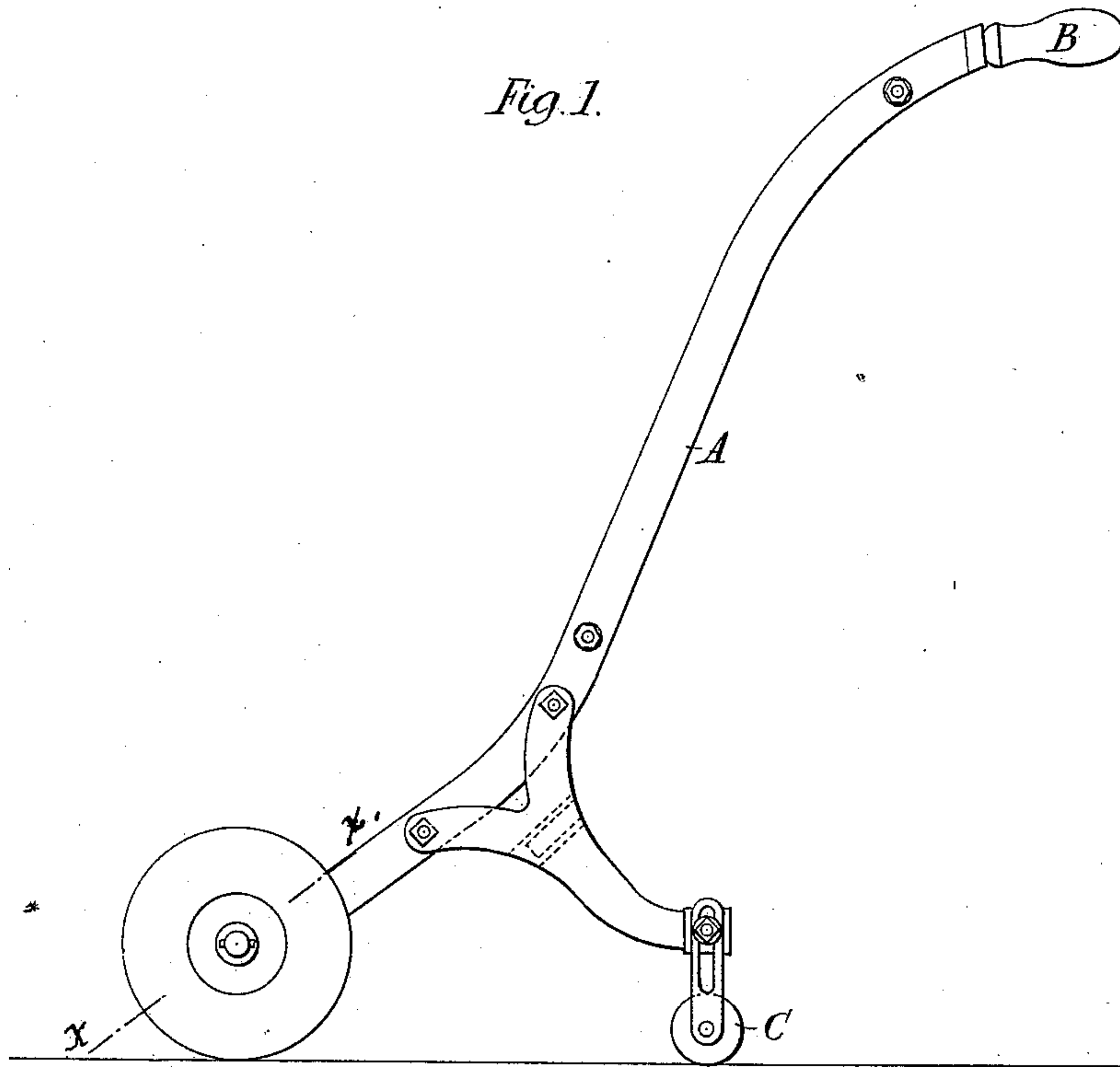
2 Sheets—Sheet 1.

C. WARREN.

LAWN MOWER.

No. 362,339.

Patented May 3, 1887.



Witnesses  
*G. Keefe*  
*A. J. Hunt*

Inventor.  
*Charles Warren*

(No Model.)

2 Sheets—Sheet 2.

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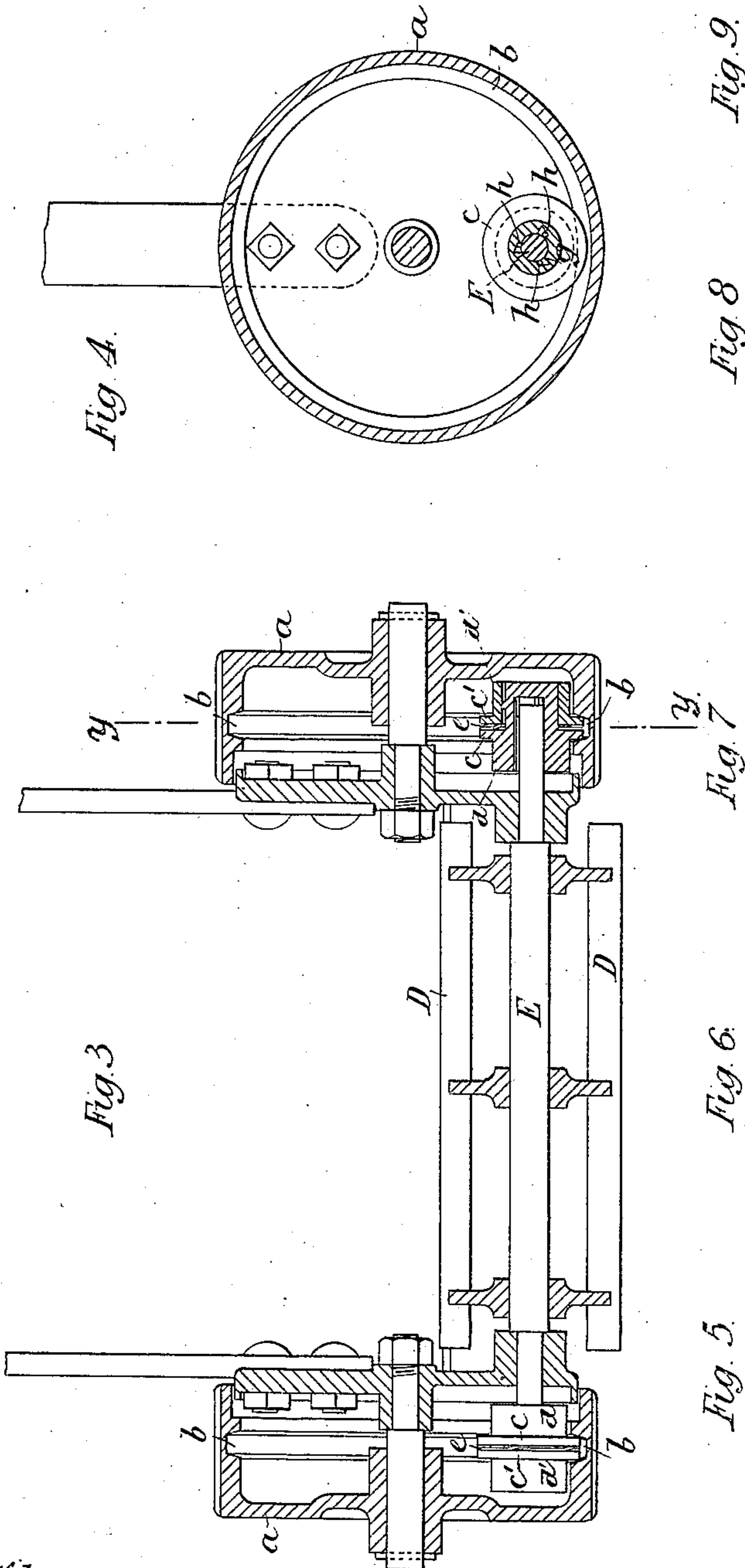


Fig. 9.

Fig. 8.

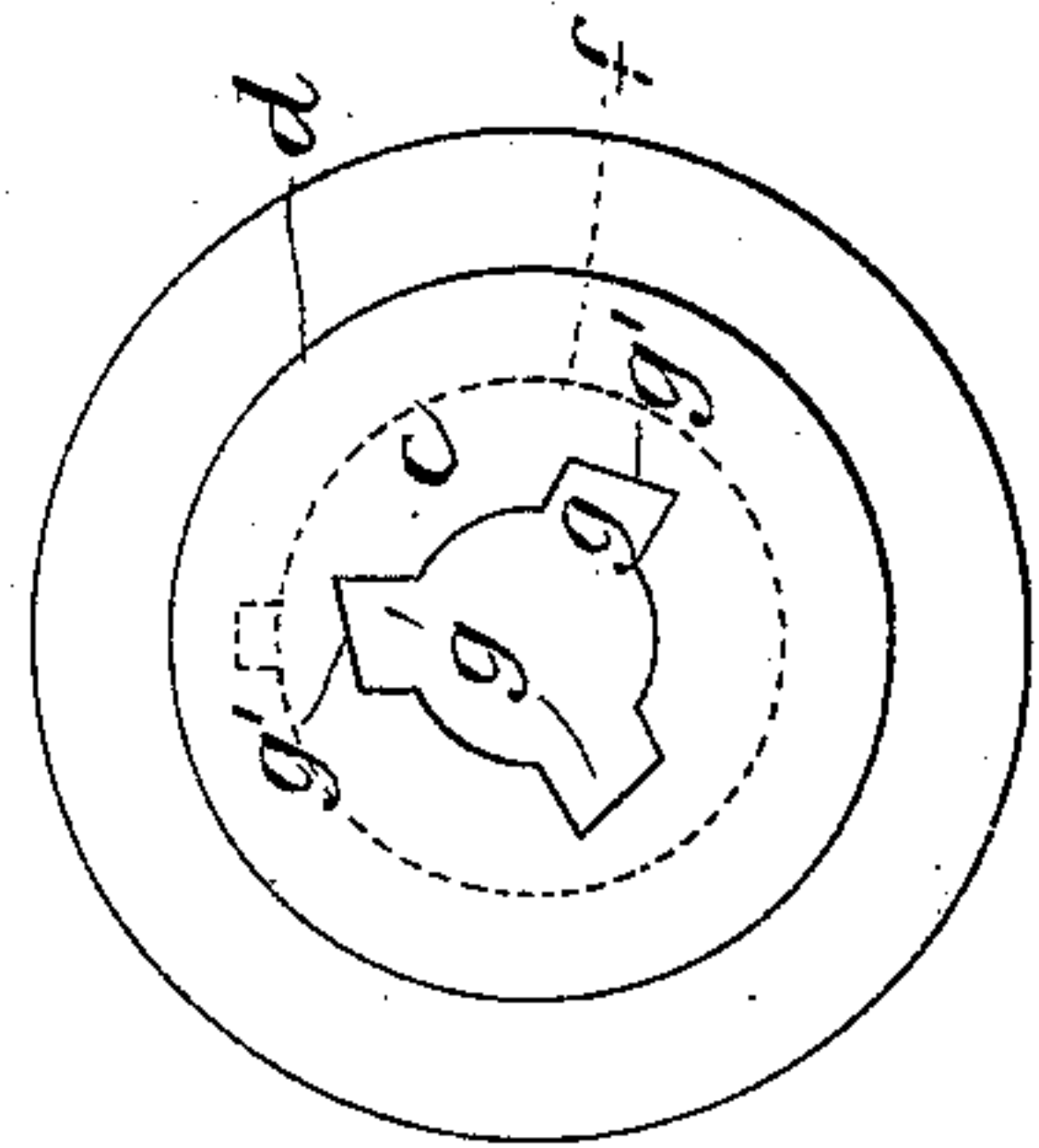
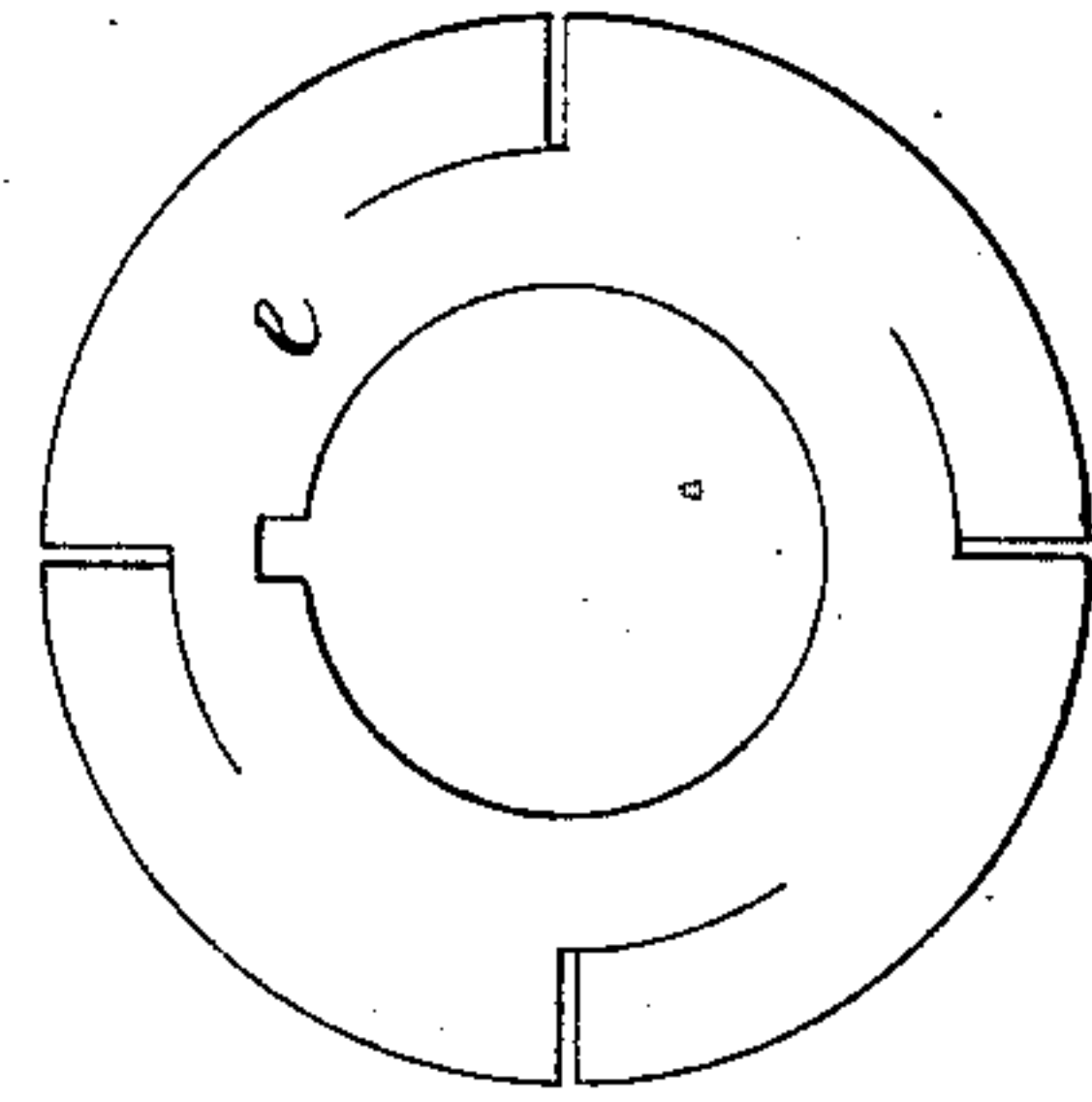
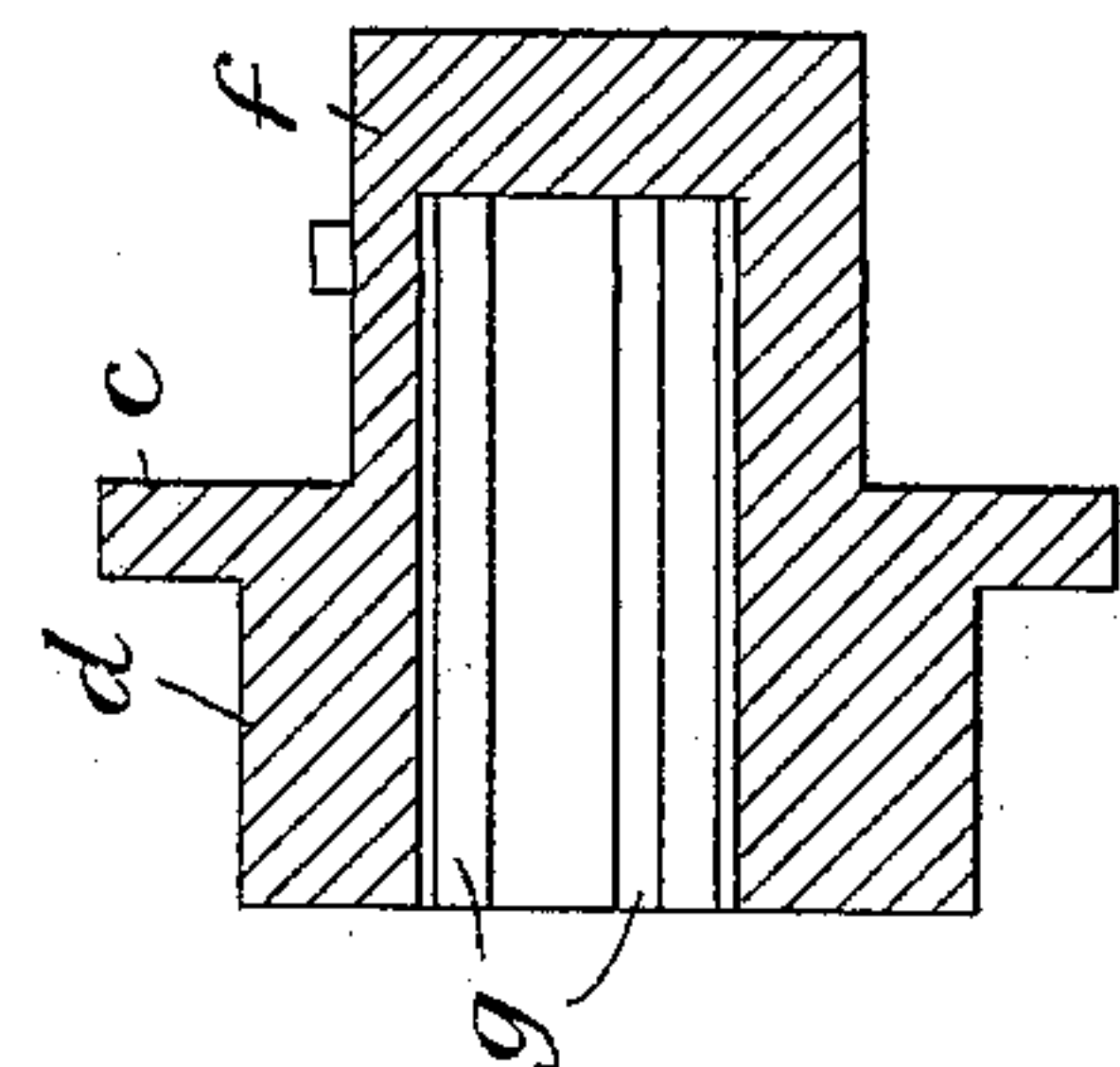
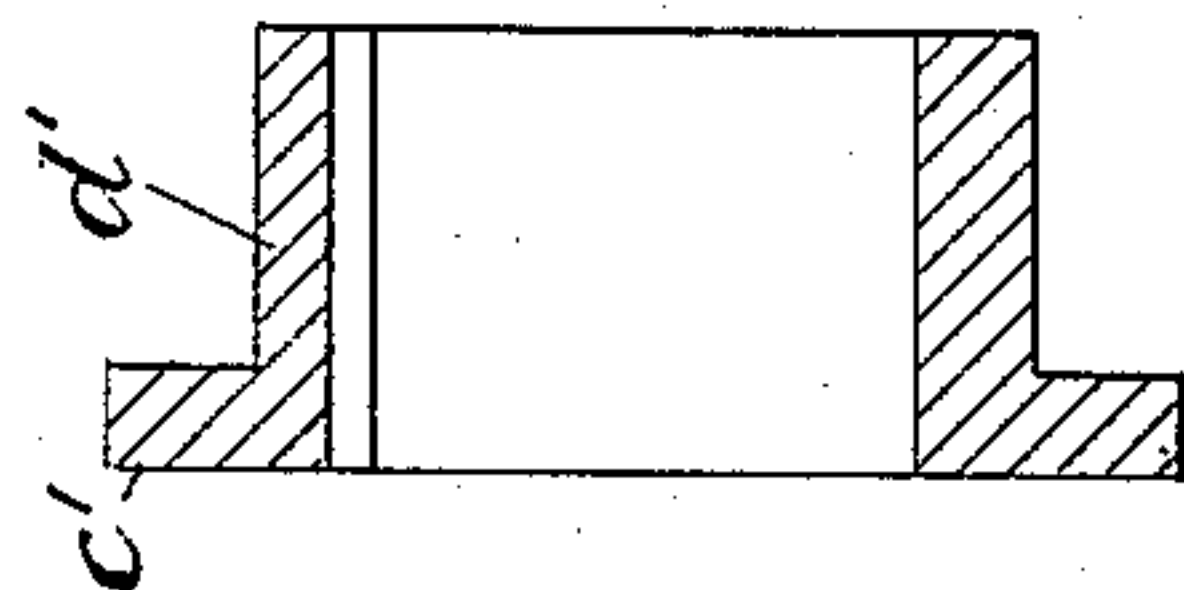


Fig. 6.

Fig. 5.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CHARLES WARREN, OF IPSWICH, ENGLAND.

## LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 362,339, dated May 3, 1887.

Application filed August 24, 1886. Serial No. 211,726. (No model.) Patented in England January 4, 1886, No. 114.

*To all whom it may concern:*

Be it known that I, CHARLES WARREN, a subject of the Queen of Great Britain, residing at Ipswich, England, have invented certain new and useful Improvements in Lawn-Mowers, (for which I have obtained a patent in Great Britain, No. 114, dated January 4, 1886,) of which the following is a specification.

10 This invention relates to an improved friction-gear and noiseless clutch for driving the cutters of lawn-mowers and throwing the cutters out of engagement when the lawn-mower is moved backward. For this purpose I form  
15 one or both of the driving wheels or rollers of the mower with an annular internal groove. The end or ends of the spindle of the cutters or cylinder extends or extend through the ends of the frame of the machine, and is or  
20 are provided with a compound yielding friction flanged collar adapted to fit in the said groove and to be actuated by frictional contact therewith. In the said flanged collar, or in the spindle of the cutters or other suitable  
25 spindle driving the cutters, I form longitudinal grooves, the bottoms of which are inclined transversely. In the said grooves I place a loose rolling piece, which is round or circular in cross-section, and which may be either a  
30 round pin or ball, as may be preferred.

In order to enable my invention to be fully understood, I will proceed to describe the same by reference to the accompanying drawings, in which—

35 Figures 1 and 2 represent a side elevation and plan, respectively, of a lawn-mower constructed according to my invention. Fig. 3 is a section on line *x x* of Fig. 1, and Fig. 4 is a section on line *y y* of Fig. 3. Figs. 5 to 9  
40 are detached views of some of the parts. Figs. 1 and 2 are drawn to a scale of about one-sixth full size, Figs. 4 and 5 about one-third full size, and Figs. 5 to 9 about full size.

Similar letters in all the figures represent  
45 similar parts.

A represents the frame of the machine, B B the handles, C the adjustment-roller, D the cutters, and E the spindle thereof, all of which are of ordinary construction.

50 *a a* are the driving wheels or rollers of the mower, and *b b* represent the peripheral

grooves with which I form the same, and which are here shown in the interior of the said wheels. The grooves *b* are formed with inclined sides, as clearly shown in Fig. 3.

55 *c c' c c'* represent the friction yielding flanged collars which I provide on the ends of the cutter-spindle E, the said collars being in fact flanges on the bosses *d* and *d'*, respectively, fitting in the grooves *b* and running in frictional contact therewith. Figs. 5 and 6 are  
60 sections of the two parts *d* and *d'*, respectively, of one of the said flanged collars, and Fig. 7 is a side view of Fig. 5. The flanges *c c'* are formed, respectively, on the collars *d d'*, and  
65 are provided with a spring, *e*, which I make, by preference, of the form shown in detached side and edge views, respectively, in Figs. 8 and 9. Each of the yielding flanged collars is hollow and is passed over the cutter-spindle E,  
70 the part *a'* being keyed loosely on a projection, *f*, of the part *d*.

*g g g* are the longitudinal grooves which I form in the flanged collar *d*, *g'* showing the inclined bottoms of the said grooves.

75 *h h h* are the round pins or rollers which I place in the grooves *g*.

By my improvements, when the mower is driven forward, the grooves *b* in the wheels or rollers *a* will communicate motion to the compound collars, and the pins or rollers *h* will wedge themselves into the smallest part of the grooves *g* and clutch the cutter-spindle E, and the cutters will be thereby driven, the said friction-gear preventing any noise or back-  
80 lash. When the machine is moved backward, the friction-flanges will still be in contact with and operated by the walls of the grooves *b* in the wheels or rollers *a*, but the pins or rollers *h* will pass into the deepest part of the grooves  
85 *g* free of the spindle E, which will therefore cease to rotate the cutters D. By this arrangement of grooves and pins I obtain a noiseless fast-and-loose action.

It will be obvious that the hereinbefore-described arrangement of yielding friction flanged collars can be employed without the grooves *g* and rollers or pins *h*, in which case the collars *d* would be keyed or pinned to the spindle E.

100 It will also be obvious that the said arrangement of grooves *g* and rollers or pins *h* can be



employed with lawn-mowers of other constructions than that shown and described, as the grooves *g* can be formed in any suitable direct or intermediate driving-spindle.

5 Where only one groove *g* and roller or pin *h* are employed, I find it advantageous to place a spring in the groove to insure an immediate grip of the roller or pin between the walls of the groove and the spindle when the machine  
10 is commenced to be moved forward.

Having now particularly described the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

15 1. In a lawn-mower, the combination, with a driving-wheel having a groove, *b*, with inclined sides, of a pair of collars, *d d'*, having flanges *c c'*, respectively, on the cutter-spindle and their intermediate spring, the said collars  
20 being driven by frictional contact of the flanges with the sides of the groove in the wheel, substantially as and for the purposes set forth.

2. In a lawn-mower, the combination, with the cutter-spindle *E*, of the friction-driven 25 flanged collars, the collar *d*, having the flange *c*, projection *f*, and longitudinal grooves *g*, and the collar *d'*, having the flange *c* and a pin or roller in the grooves, all as set forth.

3. In a lawn-mower, the combination of a 30 driving-wheel having an annular groove with its opposite sides inclined, a pair of flanged collars, as set forth, on the cutter-spindle provided with an intermediate spring and working, as set forth, in the said groove, longitudinal grooves *g* in the collar *d* with the bottom 35 surface inclined transversely, and a pin or roller in said grooves *g*, substantially as and for the purposes set forth.

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Witnesses:

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