

No. 613,885.

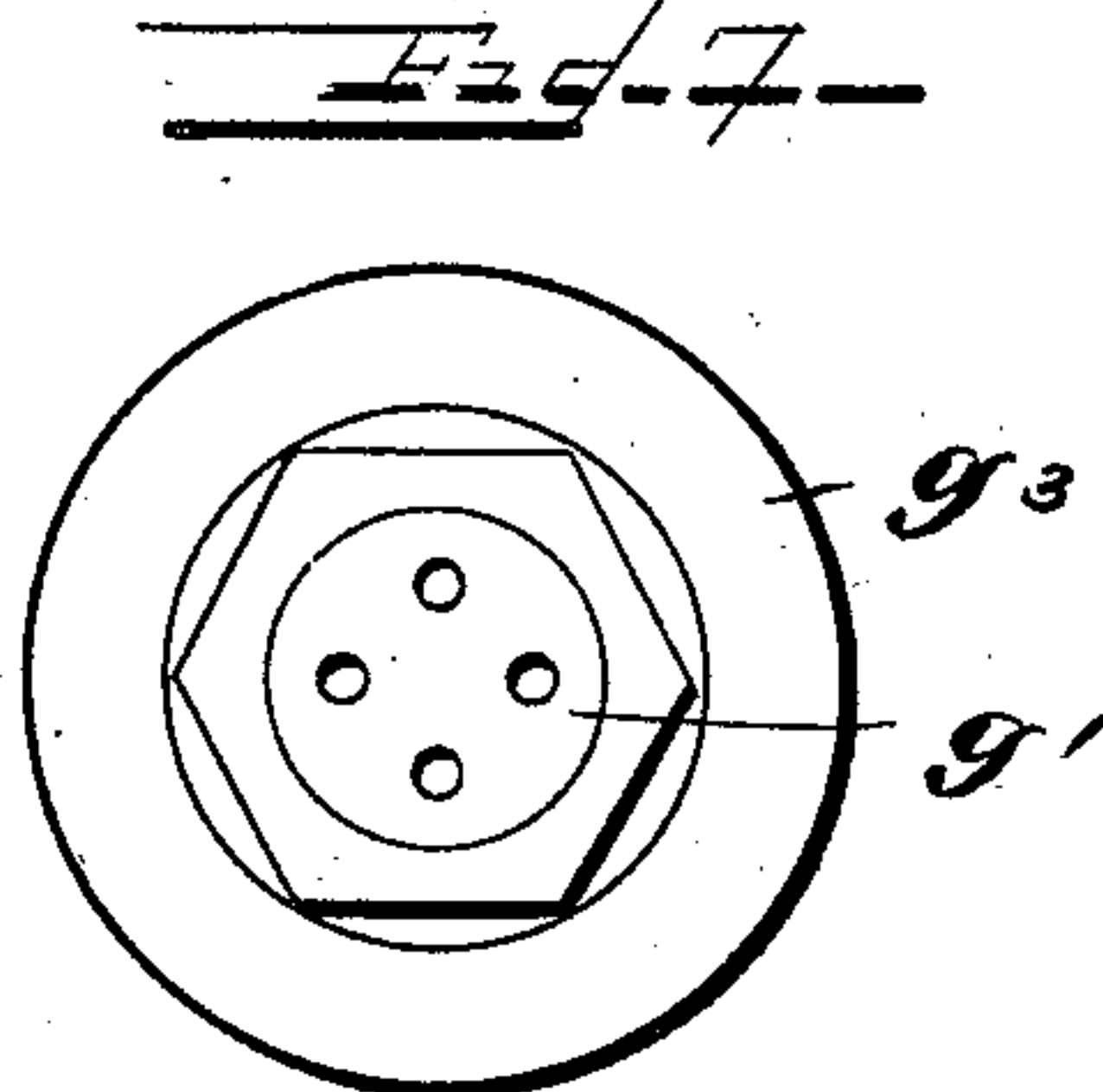
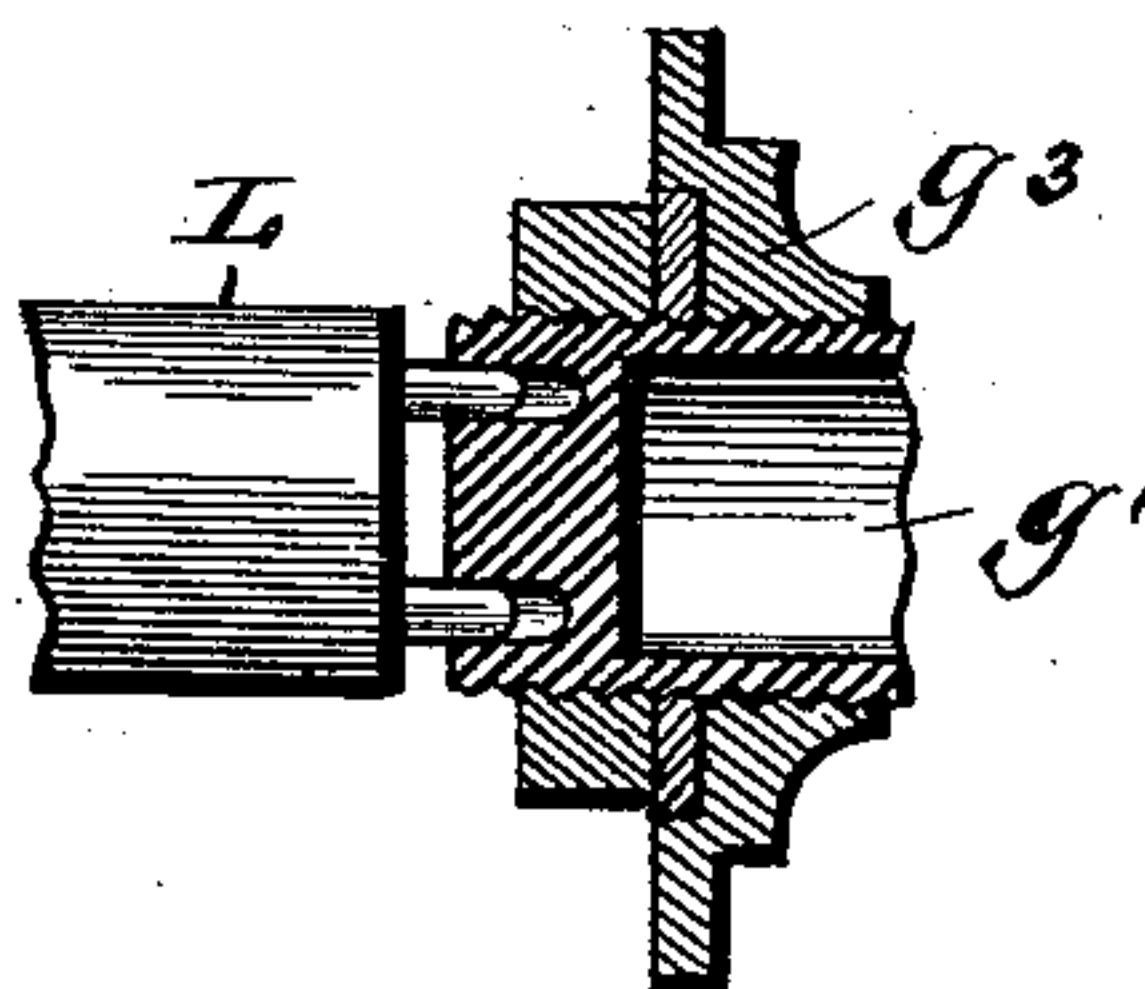
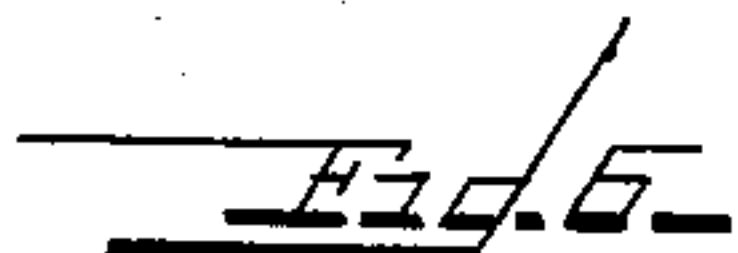
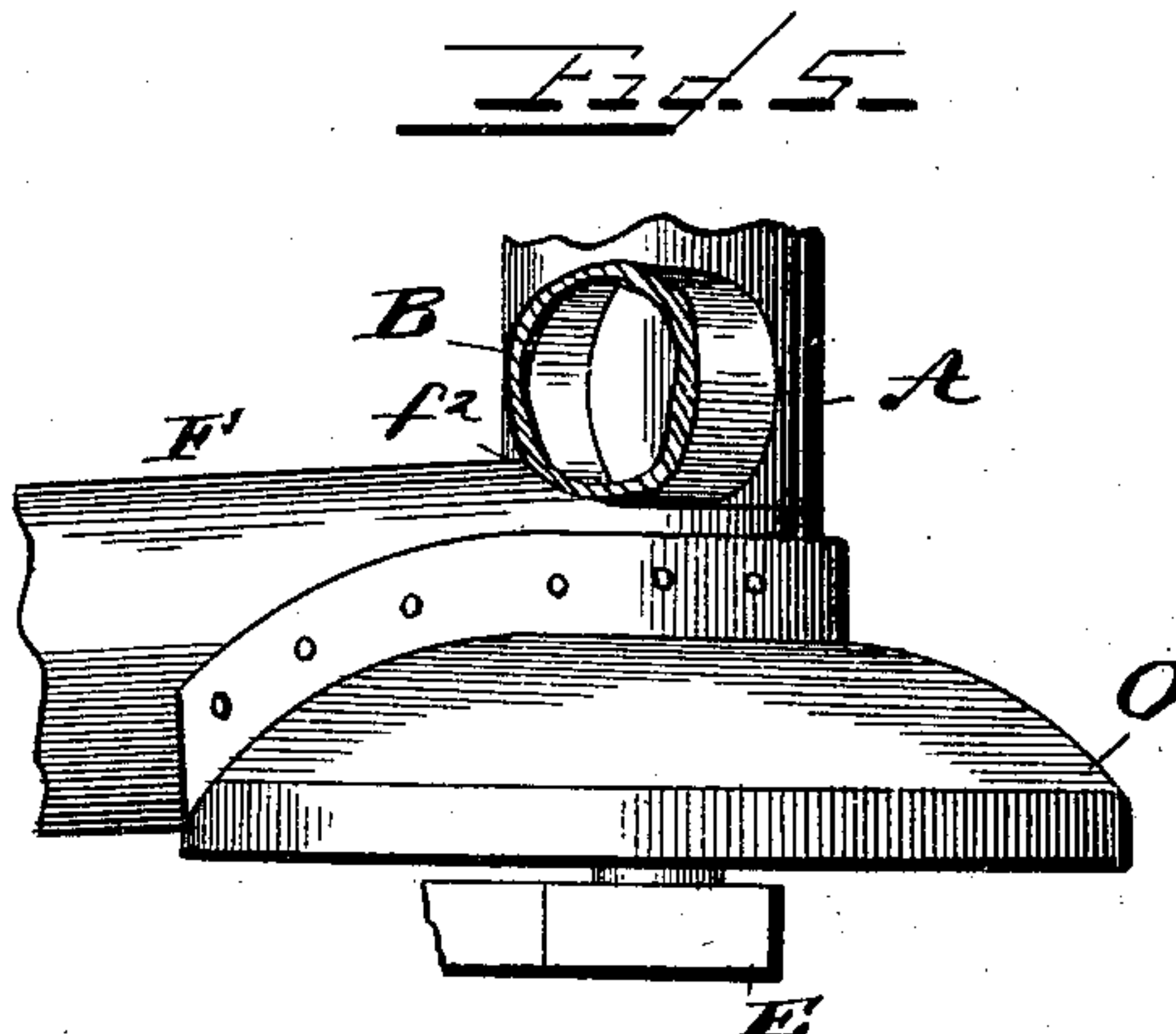
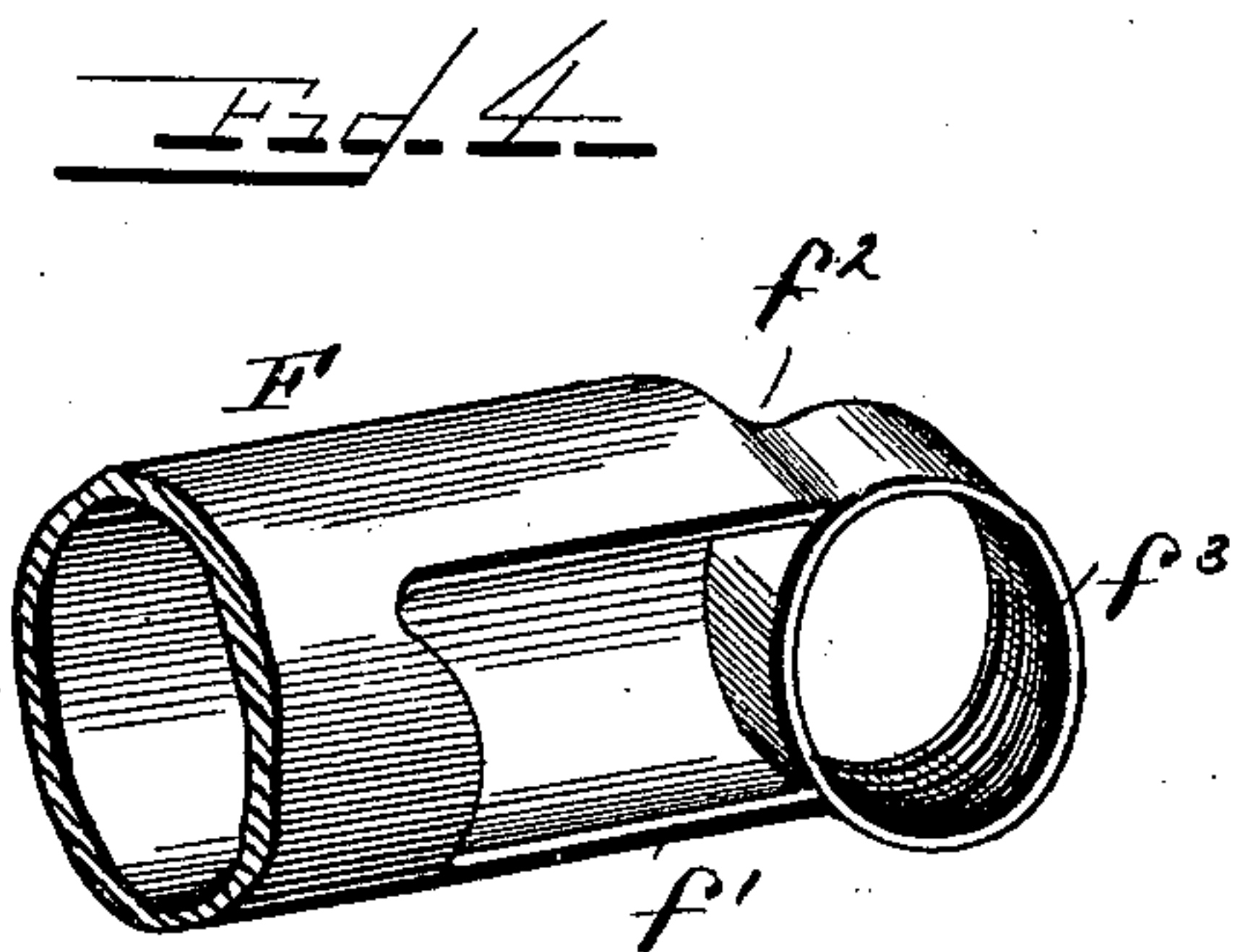
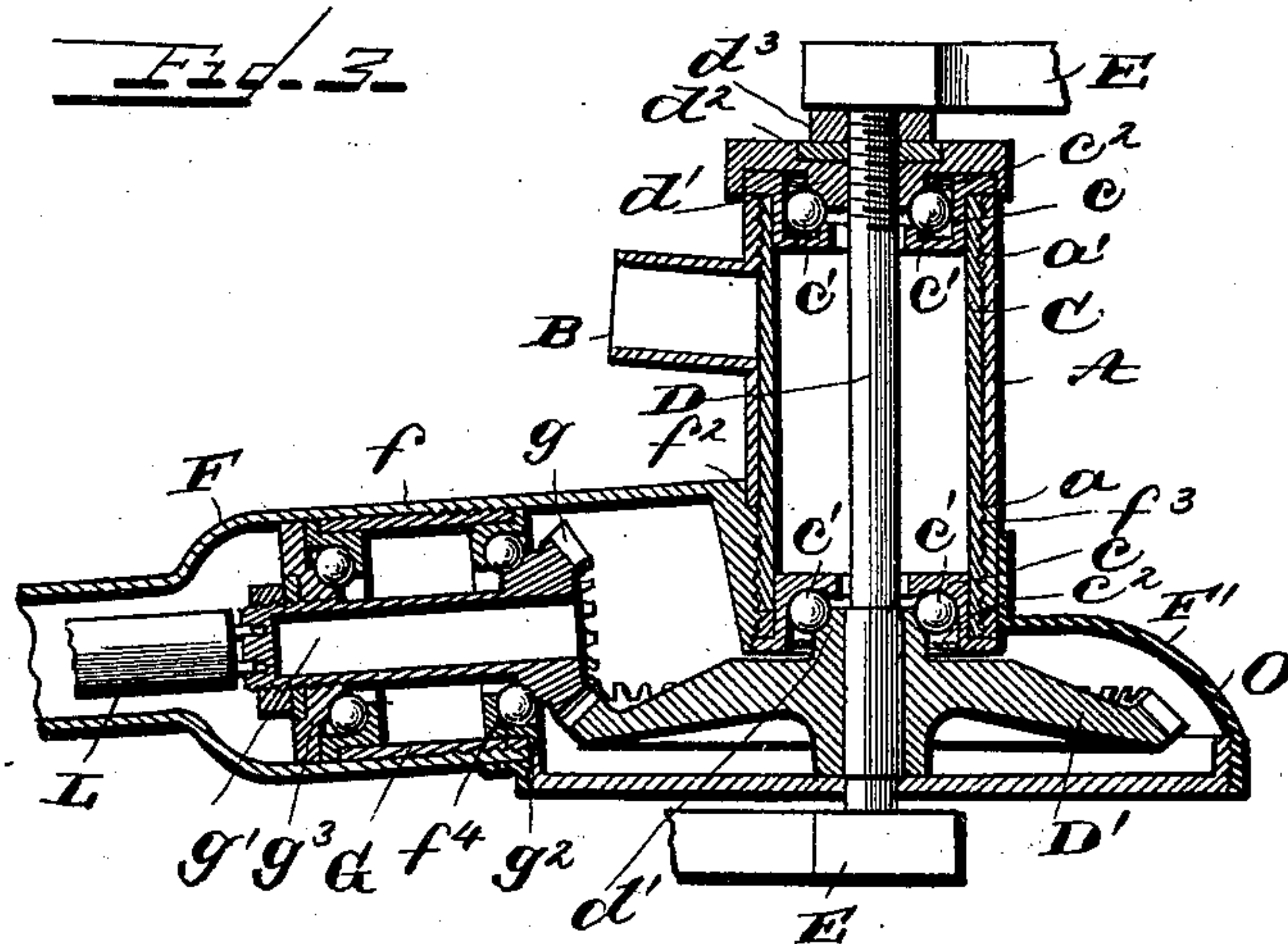
Patented Nov. 8, 1898.

H. McDONALD.
BICYCLE.

(Application filed Nov. 4, 1897.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses.

G. A. Pauberschmidt,
J. D. Kingsbery

Inventor _____

Hugh McDonald
by
Whitaker Brown
- attys.

UNITED STATES PATENT OFFICE.

HUGH McDONALD, OF WILLIAMSPORT, PENNSYLVANIA.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 613,885, dated November 8, 1898.

Application filed November 4, 1897. Serial No. 657,416. (No model.)

To all whom it may concern:

Be it known that I, HUGH McDONALD, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Bicycles; 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.

My invention is an improvement in bicycles; and it consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

Referring to the said drawings, Figure 1 represents a horizontal sectional view of the crank-hanger, side bars, and rear-wheel hub embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged horizontal sectional view of the crank-hanger and a portion of one side bar. Fig. 4 is a detail perspective view of the portion of one of the side bars which engages the bearing-sleeve. Fig. 5 is a top plan view of a portion of the crank-hanger and adjacent portions of one side bar. Fig. 6 is a detail view, partly in section, showing the method of connecting the pinion to the movable side shaft. Fig. 7 is a rear end view of one of said sleeves and its bearing-sleeve.

Referring to the drawings, A represents the crank-hanger of the bicycle, which is connected to the upper and forward frame-bars in any usual or desired manner, and is cut off on one side of the seat-post bar B, as shown at *a*. The hanger A is provided interiorly with screw-threads *a'* at the end opposite the cut-off portion *a* to receive an exteriorly-threaded bearing-sleeve C, which is screwed into the hanger, as shown in Figs. 1 and 3, and extends beyond the cut-away portion *a*. The bearing-sleeve is provided at each end with the usual ball-races *c*, balls *c'*, and ball-retainers *c''*, which constitute the bearings for the crank-shaft D.

The shaft D is provided adjacent to one end with a large driving bevel-gear D' and a cone *d*, preferably formed integral with the

gear, as shown, which engages the balls of one bearing in the bearing-sleeve C, and at its other end the said shaft is threaded to receive the adjustable cone *d'*, washer *d''*, and jam-nut *d'''* of usual or preferred construction, said cone *d'* engaging the other bearing in the bearing-sleeve. The cranks E will be attached to shaft D in any usual or preferred manner.

F represents the side frame-bar, through which passes the shaft which transmits its motion from the crank-shaft to the rear wheel and which for convenience I will designate the "removable" side bar. The end of the said side bar adjacent to the hanger is provided with an enlarged portion *f* of considerable length, which is cut away on one side, as shown at *f'*, (see Fig. 4,) and is provided beyond said cut-away portion with a curved shoulder *f''* and a concentric ring or sleeve *f'''*, disposed at a slight angle to the longitudinal axis of the bar. This sleeve *f'''* fits tightly over the bearing-sleeve C and engages the cut-off end *a* of the crank-hanger. The sleeve *f'''* may be made plain interiorly or provided with screw-threads to engage threads on the bearing-sleeve, if preferred. In Fig. 1 it is shown plain and in Fig. 3 it is shown as being threaded. In any case the end portion of the sleeve C is threaded to receive a jam-ring F', which is screwed upon said sleeve C to clamp the ring or sleeve *f'''* between it and the end *a* of the hanger. The shoulder *f''* of the side bar F fits tightly against the exterior of the hanger when the bar is in operative position.

The interior of the tubular part of the enlarged portion *f* of the removable side bar F is screw-threaded, as shown at *f''''*, to receive a bearing-sleeve G for one of the bevel-pinions *g*. The sleeve G is provided at each end with a ball-race containing bearing-balls, and the pinion *g* is secured to or formed integrally with a short stem or shaft *g'*, preferably tubular, which passes through the sleeve G. A cone *g''* is formed, preferably, integrally with the pinion *g* and engages the bearing at one end of the sleeve, and the other end of the shaft *g'* is provided with threads to receive an adjustable cone *g'''* and its washer and jam-nut.

The shaft *g'* is closed at the end opposite the pinion and is provided with a plurality of

recesses, preferably four in number. The shaft g' and its pinion g are properly adjusted in the bearing-sleeve G , and said sleeve is then inserted in the enlarged portion f of the side bar and screwed into place. In order to properly adjust this sleeve, and thus move the pinion backward or forward in the removable side bar to insure its proper engagement with the driving gear-wheel, I provide an opening f^5 , closed normally by a detachable plate f^6 , (see Fig. 2,) through which an instrument can be inserted to rotate said sleeve. At its rear end the removable side bar is provided with an enlarged portion f^7 of less length than the part f , which is screw-threaded, as shown, to engage a coupling-ring, as hereinafter described.

H represents the casing for the bevel-pin on the rear-wheel hub, which is provided with a threaded socket h , into which the spindle I for the rear wheel is firmly screwed. The said casing is also provided with a ball-bearing h' for one end of the wheel-hub.

K represents the hub of the rear wheel, which is tubular and provided on one end with a bevel-pin k for driving the rear wheel. This pinion is secured to the hub in any desired way and is provided with a suitable cone k' to engage the bearing h' in the casing. The other end of the hub K is provided with a ball-bearing k^2 , which is engaged by the adjustable cone i , which is screwed onto the spindle I in the usual manner and provided with washer and jam-nut.

The casing H is provided on its front side with a hemispherical box H' , into which is screwed a bearing-sleeve G' , constructed exactly like the sleeve G and carrying a pinion g , with its shaft engaging bearings in said sleeve, all constructed as hereinbefore described with respect to sleeve G and connected parts. The sleeve G' is adjusted until its pinion g and the pinion k mesh properly.

L is the side shaft, which is solid or hollow, as preferred, and is provided at each end with pins or projections (preferably four in number) having rounded ends which engage the recesses in the ends of the shafts of pinions g and connect the same, yet allow for the longitudinal adjustment of said pinions by means of their bearing-sleeves and also prevent the straining of the parts by any slight springing of the frame when the machine is in use. This shaft is put in operative relation with pinions g , and the end f^7 of the removable side bar is secured to the box H' by means of a reversely-threaded coupling-ring M , provided with right and left hand threads engaging right-hand threads on one of said parts and left-hand threads on the other. This ring may be provided with a set-screw or other means for holding it rigidly in position, as will be obvious. I prefer to saw the said ring at one point and provide it with ears m at each side of the cut to receive a tightening-screw m' , as shown in Fig. 2. The hub K is provided with a flange k^3 , which revolves

just inside of the casing H , so as to exclude dust and grit from the pinions. (See Fig. 1.)

N represents the stationary side bar of the frame, which is brazed or otherwise secured to the hanger and has its other end provided with a flattened portion having an aperture therein to engage the spindle I , to which it is rigidly secured by means of the cone i and its jam-nut in a well-known way.

In order to completely incase the large driving-gear D' , I provide a gear-casing O , which is preferably riveted to the head portion of the removable side bar, as shown in Fig. 1, and extends out beyond the periphery of the wheel, and said casing is provided with a circular closing-cover, which is secured thereto by screwing it into the casing, as shown, or attaching it by means of screws, if preferred, so that said cover can be removed when desired.

What I claim, and desire to secure by Letters Patent, is—

1. In a bicycle, the combination with the crank-hanger, of a bearing-sleeve detachably mounted in and secured to said hanger and provided with bearings for the crank-shaft, a hollow side bar detachably connected with said sleeve, the crank mounted in said sleeve and a shaft mounted in said hollow side bar operatively connected with said crank, substantially as described.

2. In a bicycle, the combination with the crank-hanger, of a bearing-sleeve mounted in and secured to the same and projecting beyond the hanger at one side of the same, said sleeve carrying bearings for the crank-shaft, the hollow side bar having a portion surrounding said sleeve and detachably secured thereon, the crank mounted in said sleeve and a shaft mounted in said hollow side bar and operatively connected with the said crank, substantially as described.

3. In a bicycle, the combination with the crank-hanger, of a bearing-sleeve mounted in the same, and extending beyond the hanger on one side, said sleeve carrying the bearings for the crank-shaft, the crank-shaft mounted in said sleeve, the driving-gear on said shaft, the hollow side bar having a portion surrounding said sleeve, means for clamping said surrounding portion against the end of the hanger, and the forward side-shaft pinion mounted in said hollow side bar, and engaging the driving-gear, substantially as described.

4. In a bicycle, the combination with the crank-hanger having an interiorly-screw-threaded portion, of a bearing-sleeve threaded on its exterior for engaging the interior threads of the hanger, and adapted to project beyond the hanger at one side, said sleeve carrying the bearings for the crank-shaft, the hollow side bar having a portion surrounding said projecting portion of the sleeve, and a clamping-ring engaging said sleeve, and adapted to clamp the sleeve-engaging portion of the side bar between it and the end of the hanger, substantially as described.

5. In a bicycle, the combination with the crank-hanger having an interiorly-screw-threaded portion, a bearing-sleeve exteriorly threaded, carrying the crank-shaft bearings, 5 said sleeve being adapted to engage said hanger and to project beyond the end of the same at one side, the hollow side bar having a threaded portion surrounding said sleeve, and a jam-nut or ring engaging said sleeve, 10 substantially as described.

6. In a bicycle, the combination with the crank-hanger, of a bearing-sleeve detachably mounted in said hanger and carrying the bearings for the crank-shaft, a hollow side

bar detachably secured to the said sleeve, the 15 crank-shaft, the driving-gear on said crank-shaft, the side shaft extending through said hollow side bar and provided with a pinion to engage the driving-gear, and a side bar rigidly secured to the crank-hanger, substan- 20 tially as described.

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

HUGH McDONALD.

Witnesses:

THOS. A. DAVIES,
JOHN H. WATSON.