

(Model.)

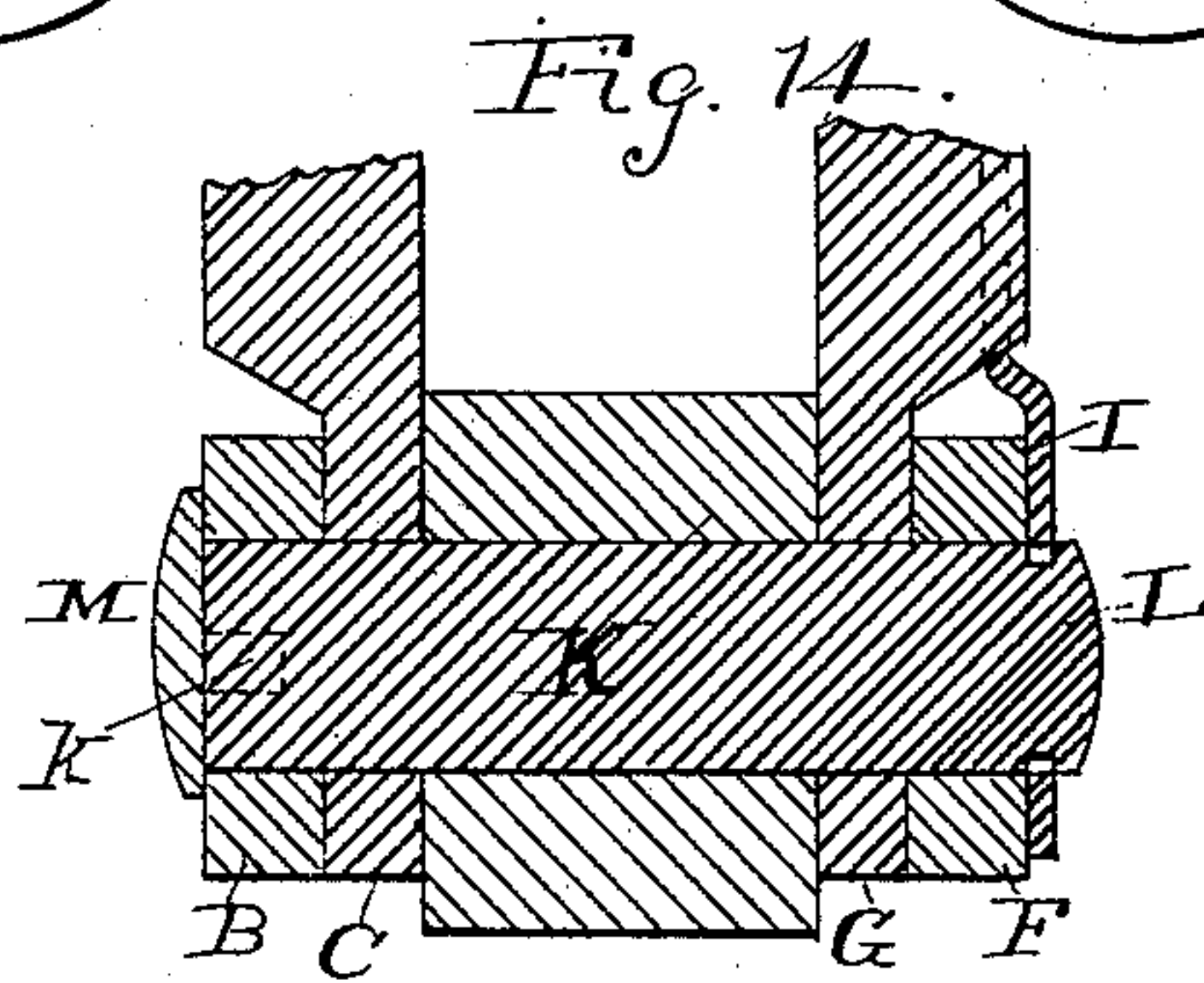
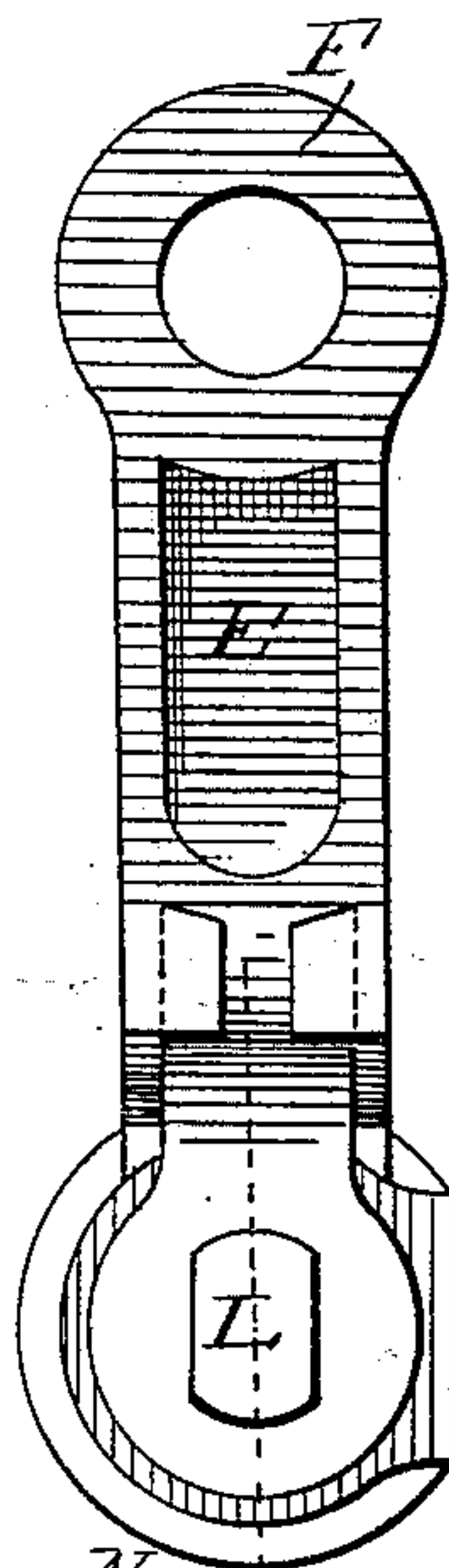
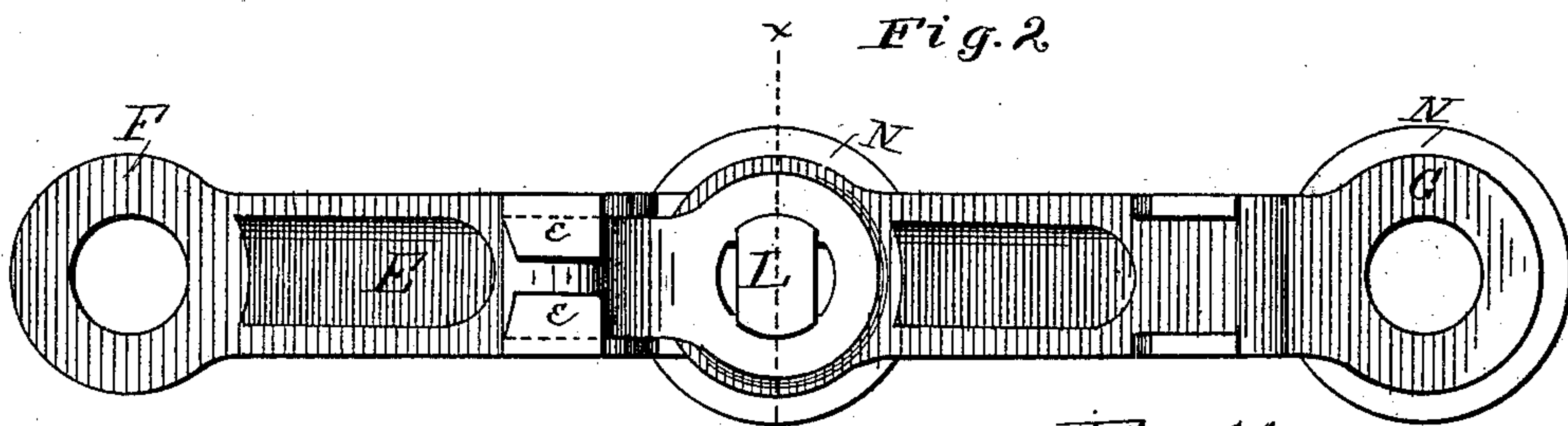
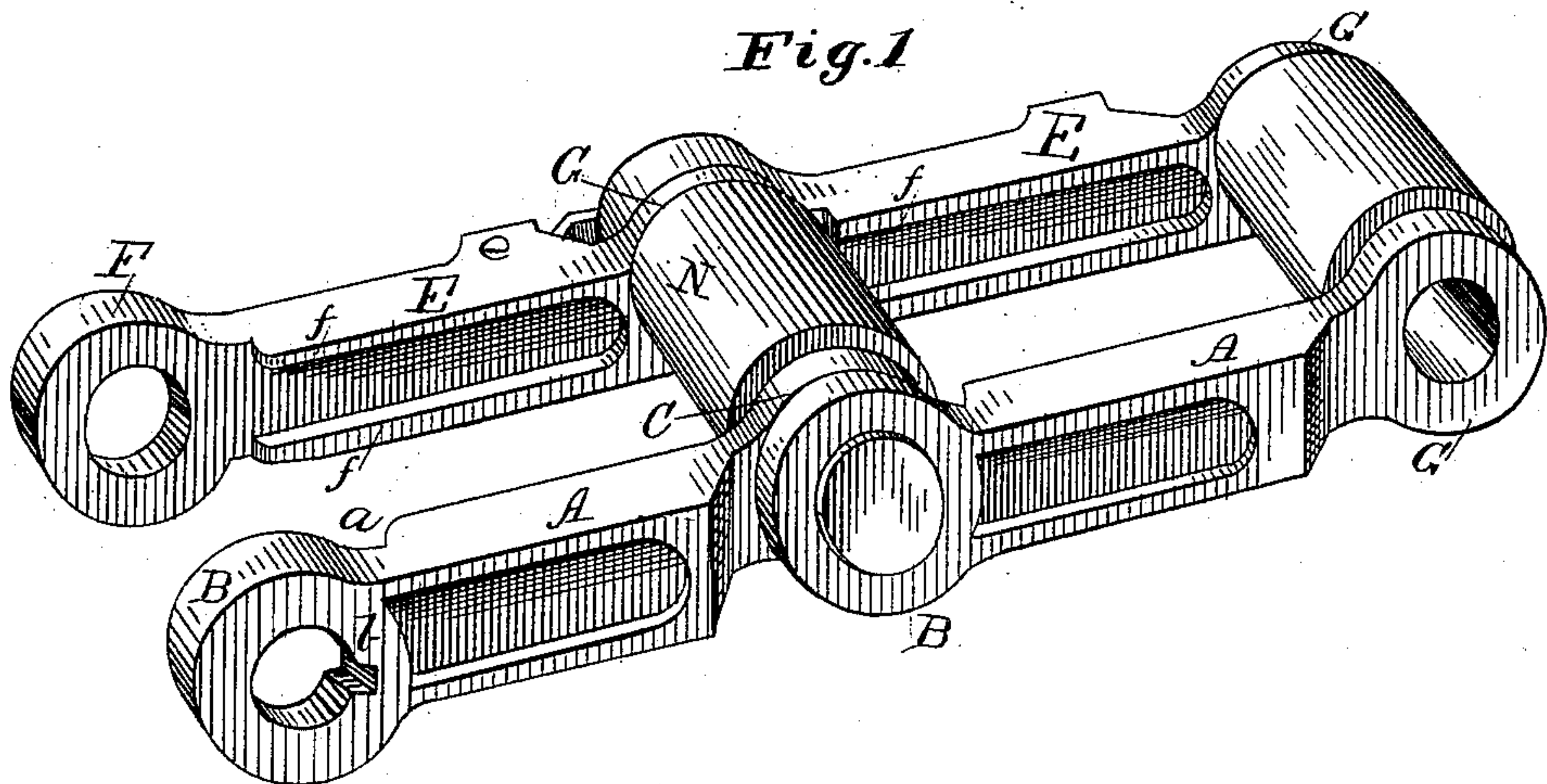
2 Sheets—Sheet '1.

B. A. LEGG.

DRIVE CHAIN.

No. 376,325.

Patented Jan. 10, 1888.



Witnesses:  
H. Burke  
C. H. Sommers

Inventor:  
Benjamin A. Legg  
by Doubleday & Bliss attys

(Model.)

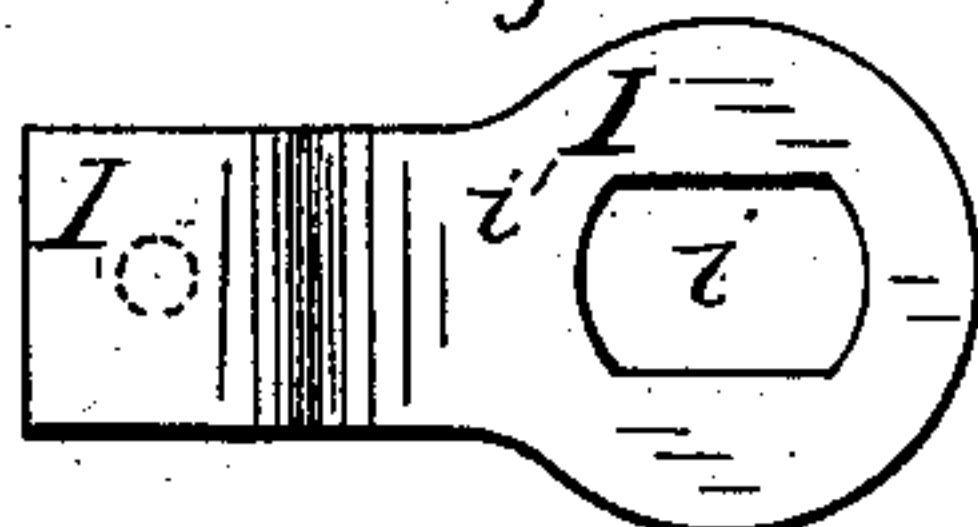
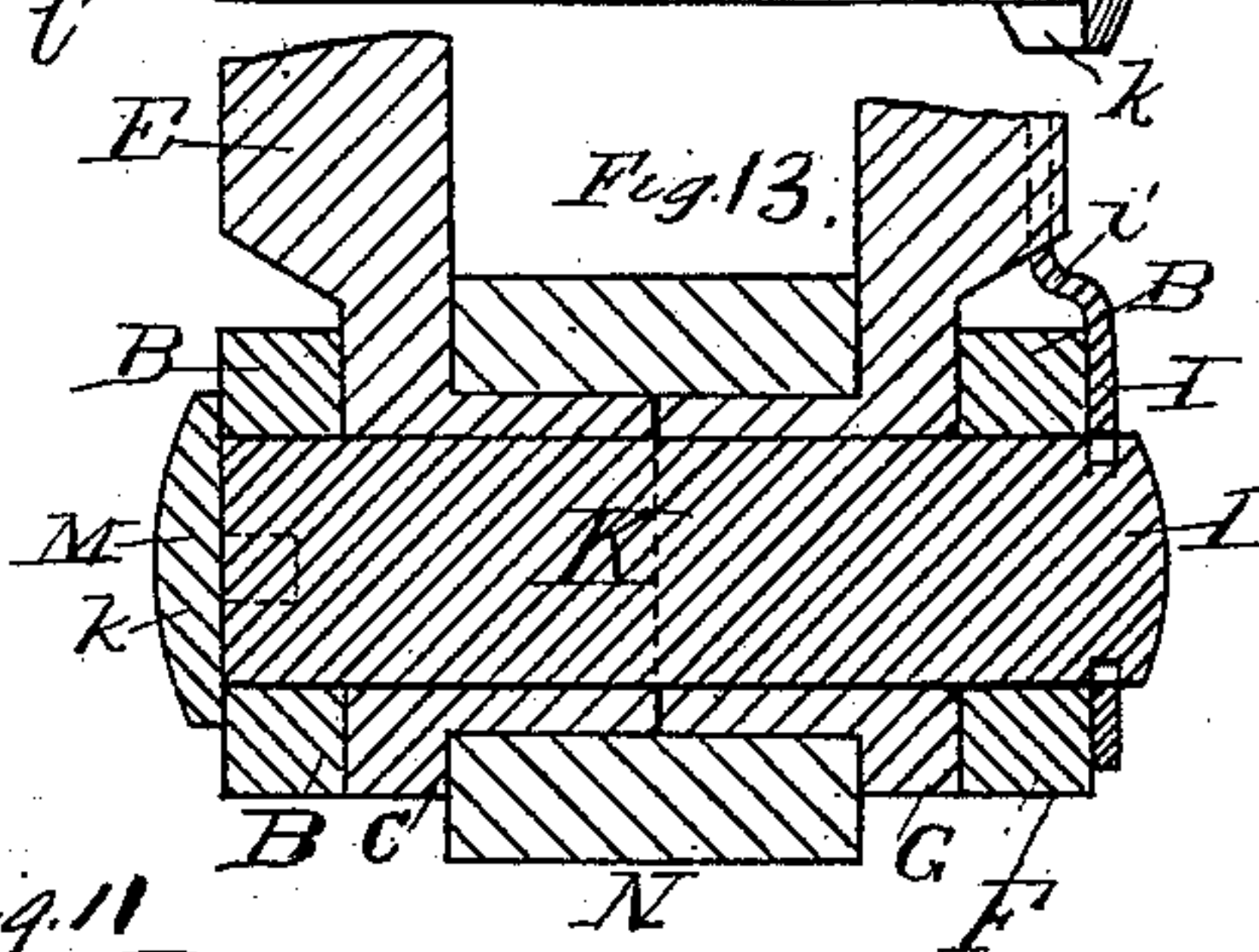
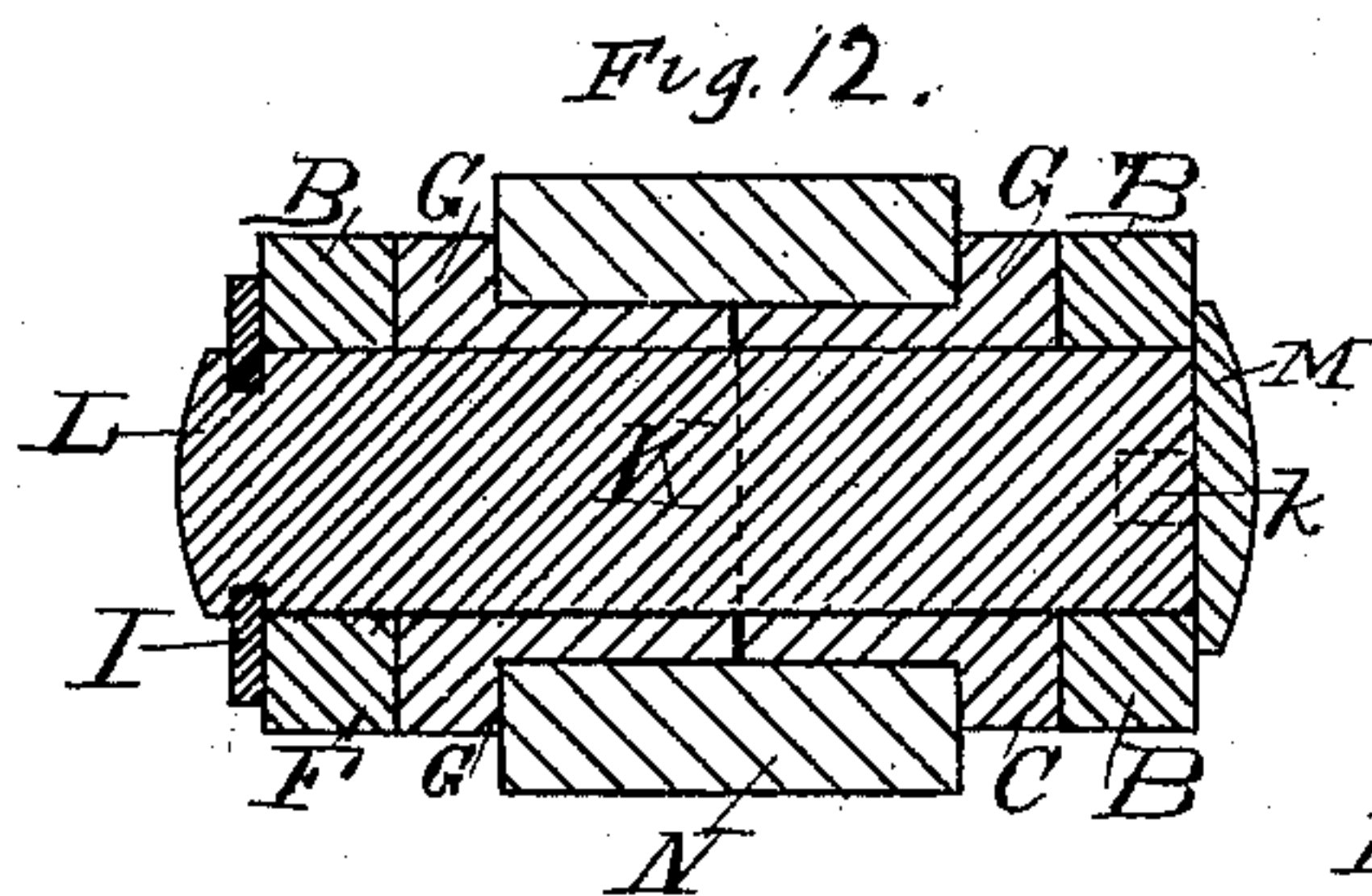
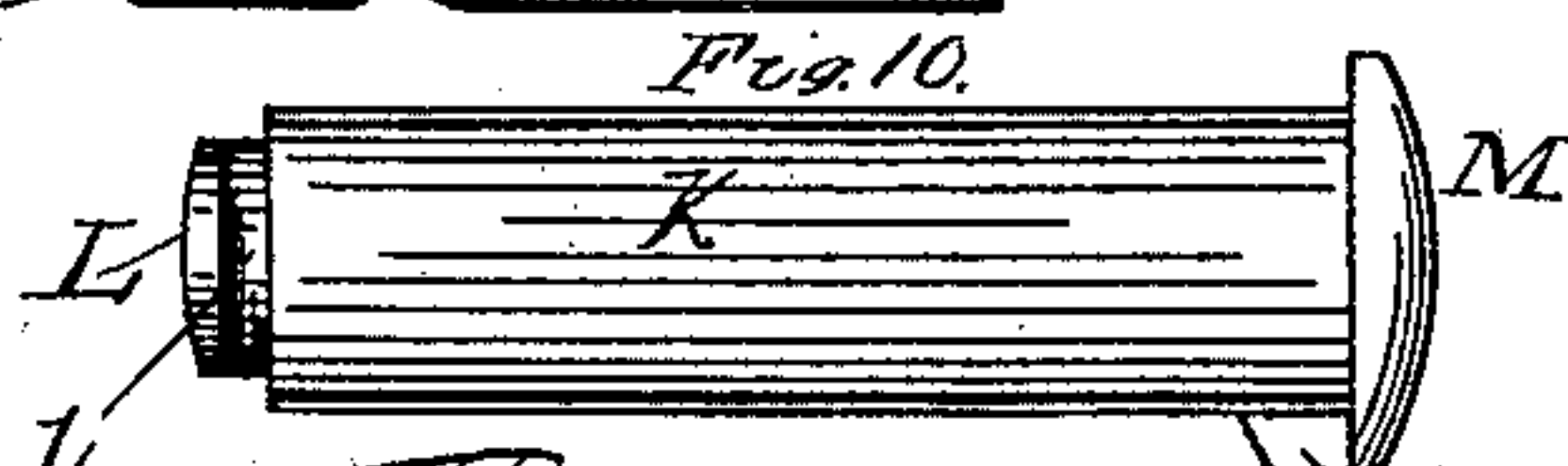
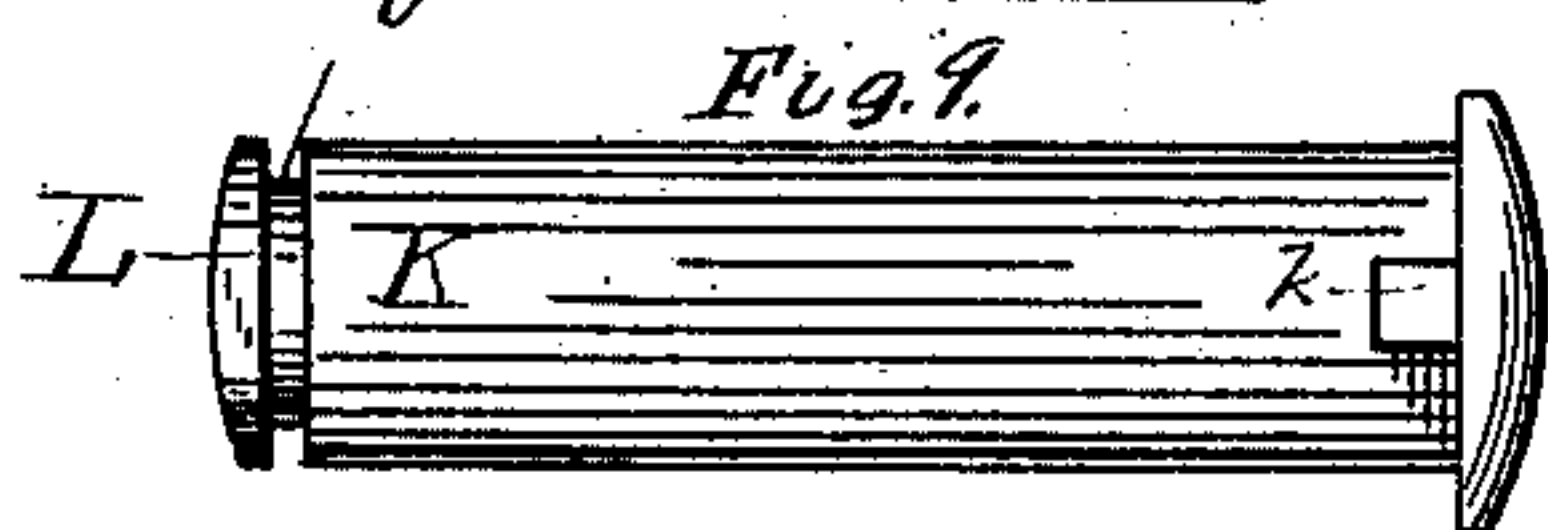
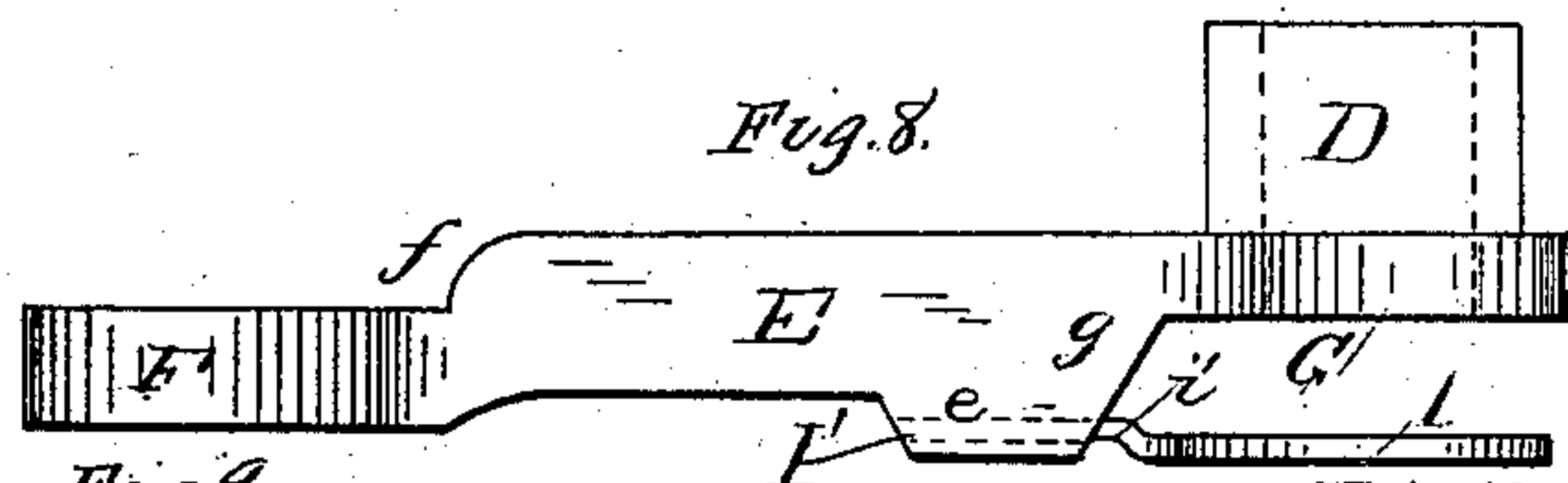
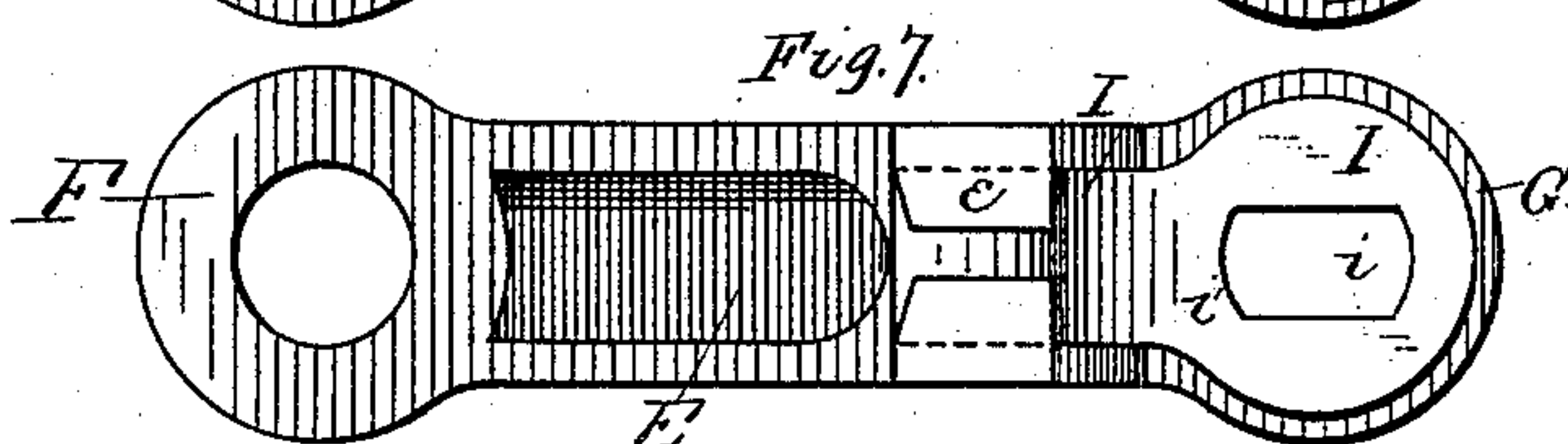
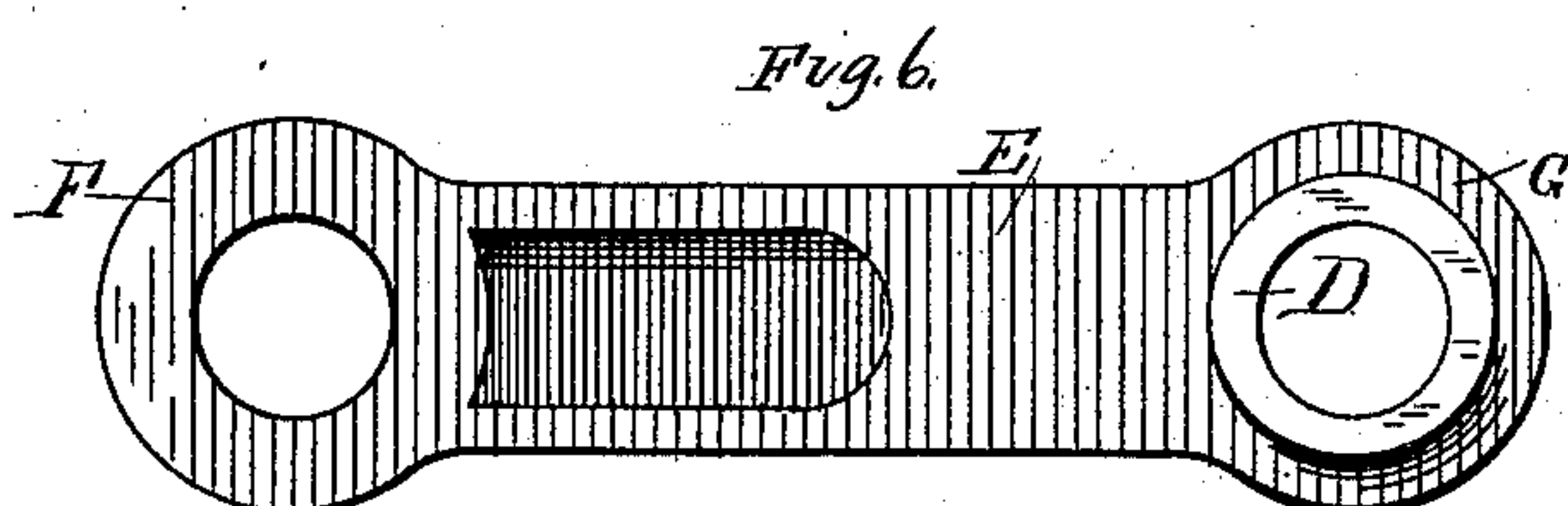
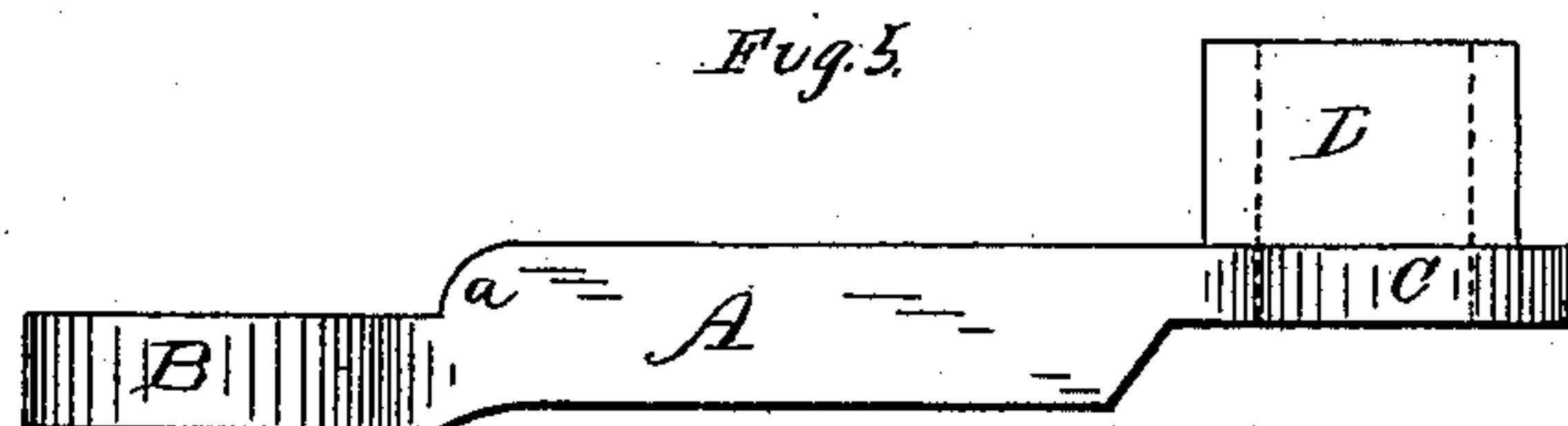
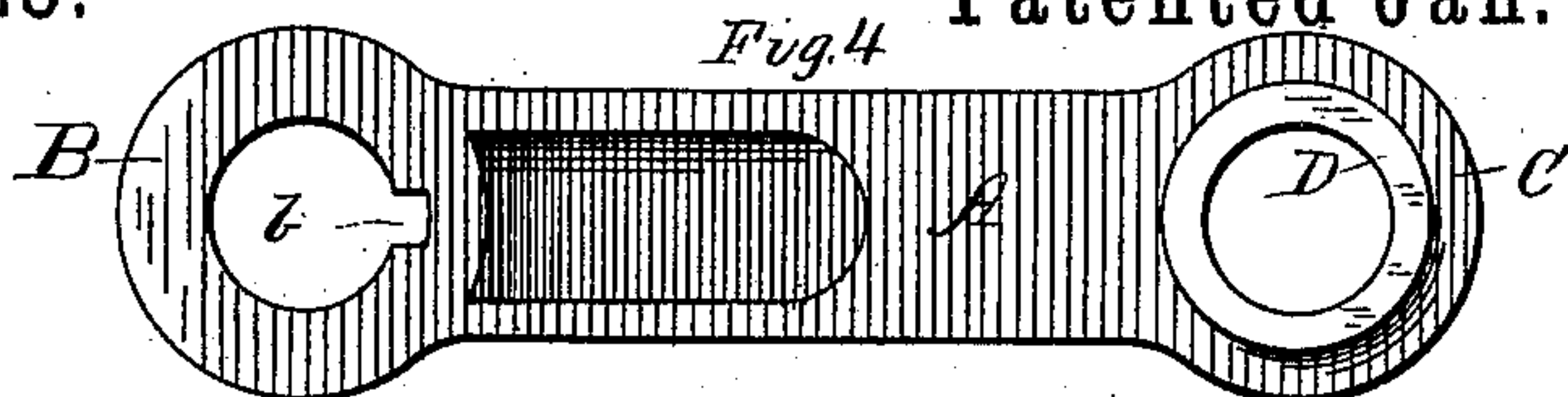
2 Sheets—Sheet 2.

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attys



# UNITED STATES PATENT OFFICE.

BENJAMIN A. LEGG, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF SAME PLACE.

## DRIVE-CHAIN.

SPECIFICATION forming part of Letters Patent No. 376,325, dated January 10, 1888.

Application filed April 19, 1884. Serial No. 128,553. (Model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN A. LEGG, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Drive-Chains, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a perspective view of the chain. Fig. 2 is a side elevation, with the links in line with each other, taken from the side opposite from that shown in Fig. 1. Fig. 3 is a side elevation with the links in such position that the parts may be detached from each other. Figs. 4, 5, 6, 7, 8, 9, 10, and 11 are details. Fig. 12 is a transverse section on line *x x*, Fig. 2. Fig. 13 is a transverse section on line *y y*, Fig. 3. Fig. 14 shows a modification.

This chain belongs to that class in which there is employed side bars arranged in pairs, which are connected by means of removable end bars and interposed spacing-thimbles or tubular sections under such a construction of parts that the end bars serve not only to connect each link with the adjacent link, but also to keep the members of each pair of side bars from spreading laterally, the spacing-thimbles or tubular sections also serving sometimes as anti-friction rollers, the construction and arrangement of parts being also such that the end bars can be detached from the side bars by an endwise movement only when the parts are in positions different from those which they ordinarily occupy when the chain is in use and running over sprocket-wheels.

I will first describe in detail the construction of the various parts and afterward explain their relation to each other when united to form a chain and placed in different relative positions.

Referring to the drawings, A B C is one of the side bars, the part B being expanded and provided with a circular opening to receive the end bar, to be hereinafter described.

*b* is a notch or recess formed in the wall of this circular seat. In the drawings it is shown formed in that part of the wall which is nearest to the central section, A, of the side bar; but it might be placed elsewhere, although I prefer it where shown, because, if made in some other part of the seat, it might unduly weaken that end of the bar.

The parts A and B are in different planes, so as to leave a shoulder at *a*. The part C is also expanded, and in this instance is provided with a short tubular extension or sleeve, D, the opening through which is of the same diameter as the seat in the part C. The part C is of less thickness than the intermediate part, A.

All of the side bars upon one side of the chain are duplicates of each other, the side bars upon the opposite side of the chain being different in construction from that shown at A B C, and are constructed substantially as follows:

E is the intermediate part, provided with two laterally-projecting ears, *e e*. The part F is expanded and provided with a circular seat to receive the end bar, and is of less thickness than the intermediate part, E. The part G is also expanded and provided with a circular seat to receive the end bar, and has a tubular section or sleeve, D, the opening through which is also adapted to receive and fit closely to the end bar.

I I' is a keeper, the part I' of which is provided with an oblong or rectangular central slot, *i*, the shank portion being firmly attached to the intermediate part, E, of the side bar, preferably by bending down the ears *e e*, the keeper being first placed in such position that its opening shall be substantially opposite to the end-bar seat through the part G of the link.

In practice I prefer to cast the ears or lugs *e e* upon the intermediate part and projecting at right angles therefrom, as shown at the right-hand end of Figs. 1, 2, 3, to facilitate drawing the pattern from the sand in molding, and as these side bars are usually made of malleable iron the ears can be bent down upon the shank I of the keeper after the latter has been placed in position, as is indicated at the central part of Figs. 2 and 3 and in Figs. 7, 8, and 12; but I do not wish to be limited to either of these methods of attaching the keeper to the side bar, because it might be done in many other ways. For instance, the shank might have a circular or angular hole in it, as indicated in dotted lines, Fig. 13, the side bar being cast with a corresponding lug, which could be riveted down after the keeper is placed in position; or the lugs might



be cast with grooves in their inner faces to receive the edges of the shank of the keeper, the inner end of which might be upset after insertion, so as to hold it firmly in place; or  
 5 other modified constructions may be employed to hold the keeper in place. As shown in the drawings, particularly in Figs. 8 and 12, the keeper may be made with an offset or shoulder at *i'*, so as to increase the width of the throat  
 10 or space between the enlarged end *I'* and the adjacent face of the part *G* of the end bar to receive the part *B* of the adjacent link.

*K L M* is the end bar, and all the end bars in a chain may be exact duplicates of each  
 15 other. The part *K* is by preference circular in cross-section and of uniform diameter throughout, except that at one end, near the head *M*, there is a projecting lug or spur, *k*, and I usually prefer to make the part *K* of  
 20 such diameter as to fit closely the seats formed for its reception in the side bar, and also the openings through the tubular projections, sleeves, or thimbles *D*. The flat head *M* will not pass through the opening in the end *B* of  
 25 the side bar. At the opposite end the end bar is reduced in diameter and provided with a locking-plate, *L*, which is oblong or rectangular in shape, its width being about equal to the diameter of the reduced portion of the end bar,  
 30 its longer diameter being about equal to the diameter of the part *K* of the end bar, thus leaving throats *l*, (see Figs. 9 and 10,) adapted to receive the keeper, as will be explained.

By an examination of the drawings it will  
 35 be readily understood that when the side bars are in the position shown in Fig. 3 the end bar can be thrust through them, and also through the keeper if it (the end bar) be held in such position that the lug *k* will enter the notch *b*;  
 40 and it will also be understood that if, after the end bar has been thrust into place, the links are straightened out the end bar will be turned a quarter of the way round upon its own axis by reason of the engagement of the lug with  
 45 the walls of the notch, and thus the locking-plate *L* will be turned crosswise of the opening *i* in the keeper, so that the end bar cannot be withdrawn from the side bars, and therefore the parts of the chain will be held firmly  
 50 in proper position, and cannot be detached from each other, except after being moved into the unusual relative position shown in Figs. 3 and 13. From the fact that the lengthwise pull upon the end bar and the resulting side-  
 55 wise pull upon the keeper is resisted by the end *F*, which is interposed between the keeper and the adjacent end *G* of the side bar in each link, the keeper may be made of quite thin metal, and there is little or no strain  
 60 thrown upon the device by which it is attached to its side bar.

*N* is an anti-friction roller mounted upon the tubular sections or thimbles *D D*; but I do not wish to be limited to the employment of  
 65 these rollers, because under many circumstances the chains will operate satisfactorily without them.

By reason of the parts *B C F G* being thinner than the intermediate parts, *A E*, respectively, of the links, the outer edges of the chain  
 70 are in substantially parallel planes, thus constituting what is commonly known as a "ribbon-chain;" and although such reduction in thickness in these parts *B C F G* results in the  
 75 formation of shoulders or offsets, as at *a f g*, yet these shoulders perform no function whatever in the chain, and are merely incidental to the peculiar structure of these links, having comparatively thin ends. In fact, as the  
 80 chain is constructed it is impossible for the shoulders to ever come in contact with the ends of the adjacent links, as they do in another class of chains, where such shoulders are employed to prevent accidental displacement or separation of the links from each other.  
 85 While in practice I prefer to make this chain of malleable iron, I do not wish to be limited thereby, as it may be made of any suitable material.

I prefer to form the sleeves or thimbles in  
 90 short sections, as shown, and to cast them integrally with the side bars, and also to make the openings through them of such size as to fit the end bars closely, in order to provide wearing-surfaces of greater extent, it being evident  
 95 that the end bars are locked firmly to the ends *B B* of the side bars; but I do not wish to be limited to such construction, because my chain might be made with a simple spacing-thimble mounted on the end bar and serving to keep  
 100 the side bars a proper distance apart; or the anti-friction roller might be made to perform the same function; or a spacing-thimble and anti-friction roller both might be mounted upon each end bar without departing from the spirit  
 105 of my invention.

I am aware that chain-links have been constructed with a tubular end bar and side bars, each attached at one end to the tubular end bar and cast integrally therewith, a number of  
 110 such links being connected together by means of pintles, each of which is seated in one of the tubular end bars and is connected to the forked end of an adjacent link; but my invention relates to an entirely different class of chains, in  
 115 which the end bars are not tubular, but are adapted to receive anti-friction rollers, and in which the side bars of each link are separable and require either an anti-friction roller or other equivalent of a spacing-thimble to be  
 120 placed upon the end bar to keep the side bars a proper distance apart, or else that the end bar be made of increased diameter in the center, so that it shall have shoulders against which the inner faces of the side bars shall  
 125 abut, and thus be kept apart, substantially as is done in the well-known types of chains. In this latter construction it might be found desirable to employ a locking-plate, *I I'*, at each end of the end bar, although in practice I prefer the construction shown.

What I claim is—

1. In a drive-chain, the combination of the side bars, the end bars or pintles, the sleeves



attached to the side bars and surrounding the pintles, the latter being locked in their seats, so as to be incapable of rotation relative to their surrounding sleeves, and the keepers attached to and carried by the side bars and engaging with the notches or recesses in the pintles, so as to prevent accidental displacement of the end bars when the links of the chain are in ordinary working relation, substantially as set forth.

2. In a drive-chain, the side bar provided with the keeper permanently attached thereto, said keeper having the rectangular opening *i*, adapted to receive the end of the end bar, substantially as set forth.

3. In a drive-chain, the side bar provided with projecting ears *e e*, adapted to receive and retain the keeper, substantially as set forth.

4. In a drive-chain, the combination, with the separable side bars, A B C and E F G, pro-

vided with the keeper projecting at the side of the end G, whereby there is formed a throat for the end F of an adjacent link, of the end bar provided with the locking-plate, substantially as set forth.

5. In a drive-chain, the combination, with a series of links arranged to overlap each other at their ends and keepers having elongated openings, of removable pintles having at their ends expanding heads, each pintle having a projection intermediate the expanded heads, and adapted to engage with one of the links and prevent rotation of the pintle relative to said link, substantially as set forth.

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

BENJAMIN A. LEGG.

Witnesses:

THEO. YOCKUM,

CHARLES W. MILLER.