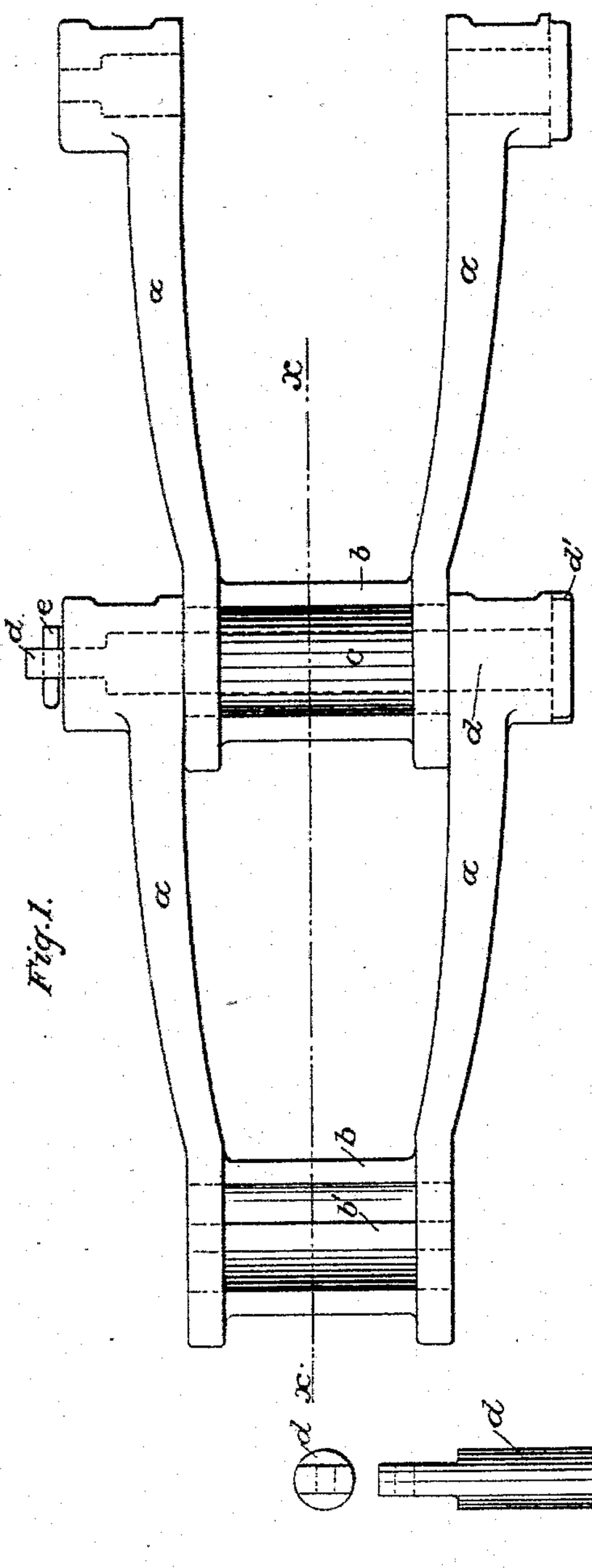
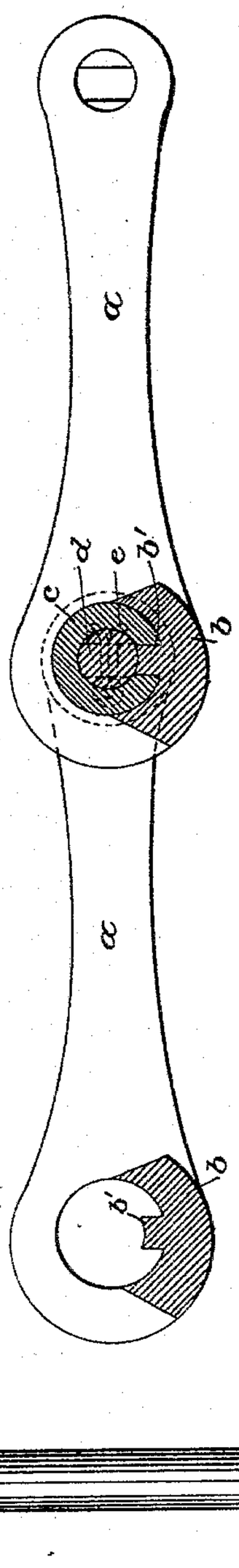
(No Model.)

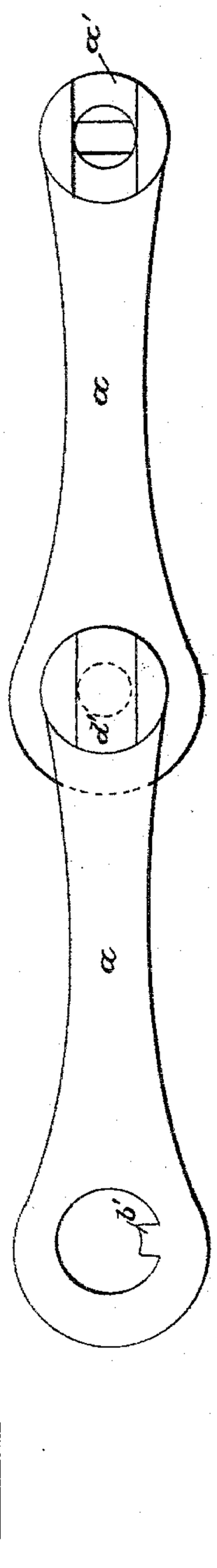
F. LEY.

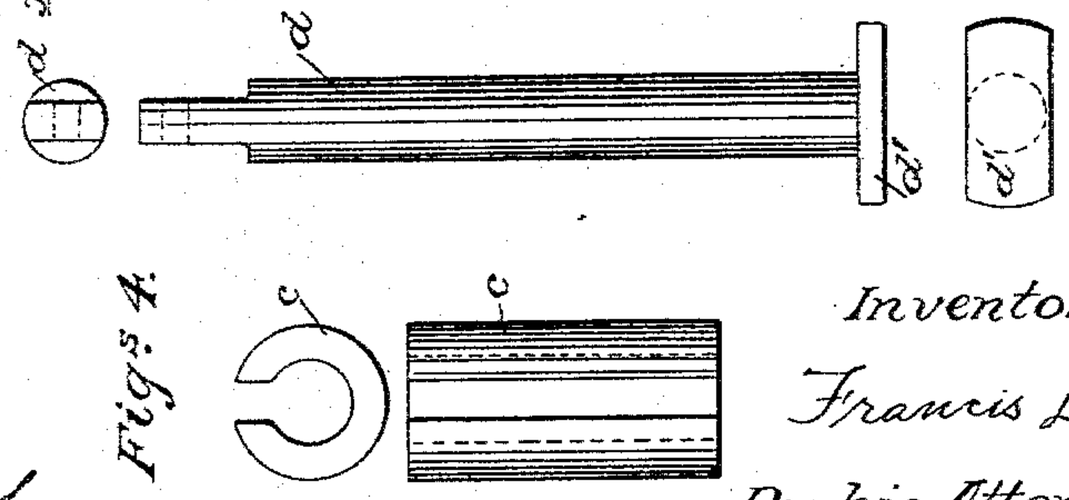
DRIVE CHAIN.

No. 494,962. Patented Apr. 4, 1893.









Witnesses.
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UNITED STATES PATENT OFFICE.

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DRIVE-CHAIN.

SPECIFICATION forming part of Letters Patent No. 494,962, dated April 4, 1893.

Application filed August 5, 1892. Serial No. 442,218. (No model.) Patented in England December 13, 1887, No. 17,171.

To all whom it may concern:

Be it known that I, FRANCIS LEY, engineer, a subject of the Queen of Great Britain, residing at the Vulcan Iron Works, Derby, England, have invented certain new and useful Improvements in Chains for Working on Chain-Wheels, (for which I have received Letters Patent in Great Britain, No. 17,171, dated December 13, 1887,) of which the following is a specification.

My invention has for its main object to provide for use a chain adapted for use in connection with sprocket-wheels, in which, those portions of the articulated links which are subjected to wear, by contact with the wheels over which such chains are run, and by the frictional draft strain, on the hinge joints, being separable from the other parts of the chain, may be easily renewed, when injuriously worn, and may also be very conveniently case-hardened; to render them more durable.

To this main end and object my invention consists, primarily, in a chain, the links of which have end-bars, those portions of which that are adapted to work in contact with chain wheels, are made removable and renewable; and, secondarily, in both parts of each of the articulations, or joints, being separable and removable; all as will be hereinafter more fully explained, and as will be more particularly pointed out in the claims of this specification.

To enable those skilled in the art to make and use chains for sprocket-wheels involving my improvements, in either the precise form shown, or under some modification of my invention, I will now proceed to more fully describe the latter, referring by letters to the accompanying drawings which form part of this specification, and in which I have shown my improved chain made in that form in which I have, so far, successfully, used it.

In the drawings, Figure 1, is a plan, or face, view, of two connected links. Fig. 2, is a vertical section of the same, taken in a plane indicated by the line *x x* of Fig. 1. Fig. 3, is a side, or edge, view of the coupled links, and Fig. 4 is a group of views showing, detached from each other and from the other parts of the chain, the bush-like removable end-bar portion, and the separable pintle, or male member of the hinge joint.

In all the figures the same part will be found designated by the same reference letter.

Each link, it will be seen, comprises two, similar, side-bars *a*, *a*, and an end-bar *b*, of the shape shown; which three parts are preferably cast integral.

c is a bushing-like device which, as shown, is substantially tubular, and is about circular in cross-sectional form; which device is adapted to be placed in position, relatively to the part *b*, by inserting it through holes, or perforations, in the end-portions of the side bars *a*, *a*, and which, when the parts are properly assembled, lies within the semi-circular cavity of the trough-like device (or partial end-bar) *b;* all as clearly shown in the drawings. When the partial end-bar *b*, with its attached side-bars *a*, *a*, and the device *c*, are assembled, the last named part is prevented from turning, within the circular perforations of the said end-bars, and in the semi-cylindrical seat of the bar *b*, by the rib *b'*, which runs along and projects from the bottom of the trough-like device *b*, as shown; but some other means, or expedient, may of course, be adopted to render the parts *b* and *c* relatively immovable, in a circumferential direction.

Any longitudinal movement of the parts *b* and *c*, relatively; or any escapement of the device *c*, endwise, from its seat in the trough-like bar *b*, is prevented by the side-bars of the next adjacent link, which, when the links are coupled, as shown, straddle, or embrace, endwise, the said united parts *b* and *c*.

The coupled links are held together, in an articulated condition by the pin, or pintle, *d*, which, as shown, passes through a hole in the end of one of the two embracing side-bars *a;* thence through the bush-like device *c;* and thence through the perforated end of the other one of the two embracing side-bars, all as clearly shown in the drawings. Said pin, or pintle *d*, is formed, or provided, at one end, as seen, with a polygonally shaped head, *d';* that is let into a correspondingly shaped recess, or depression, in the hub-like portion of

one of the two side-bars *a;* and it has its opposite end flattened, or squared; so that, both ends of said pin are held against any tendency to rotate within the perforations of the hub-like end portions of the side-bars *a*, *a*. A split pin, or key, *e*, passed through a hole in the protruding end of the pintle *d* (see Fig. 1), serves to secure said pintle in place.

In the operation of a chain made substantially as herein shown and described, the exposed surfaces, or portions, of the devices *c*, run in contact with the teeth, or sprockets, of the wheels, over which the chain passes, and bear all the frictional draft strain and wear to which the chain is subject, by contact with said wheels; and as these parts are easily removable, and renewable, it is only necessary, in order to repair all such wear and tear to these parts as may have materially changed the pitch of the chain and otherwise impaired its serviceableness, to uncouple the links, remove the worn out parts *c*, replace them with new duplicate parts, and then recouple the links.

In the manufacture of my improved chain, considerable advantage is derived from the separableness of the parts *c* and *d*, on which comes all the wear; since it is easy to render these separate parts more durable, by case-hardening them; and it will be seen that while the major fruits of my invention come from the structural feature of the separate and easily removed and replaced part *c*, which is subjected to all the contacting wear, affected by the wheels over which the chain is designed to travel; more, or less, advantage is derived from the construction of the chain, so that both the male and female members of the hinge-like joint are removable, separately, so that either, or both, can be renewed to economically repair the chain.

I am aware that chains have heretofore been constructed, on which anti-friction rollers were mounted to rotate upon fixed end-bars, or pintle-like devices, formed integrally with one of the said bars of the chain, as illustrated, for instance, in the Lechner patent, No. 267,003, of November 7, 1882; but my invention should not be confounded with any such, radically different, construction, in which not only are there no removable, separate, pintle-like devices; but in which, furthermore, the anti-friction rollers are employed to avoid frictional wear of the sprocket wheels; but themselves wear away the bars on which they revolve, and thus soon render useless the said bars, and also the side bars with which they are cast integral.

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

1. In a chain link of the type shown, the combination with the side-bars; and a bar connecting one set of their ends, of devices immovably seated on said bar; but separate and removable therefrom, and operating to receive, or sustain, the frictional draft-strain to which the link is subjected by contact with the wheel on which it may be worked; all substantially as hereinbefore set forth.

2. In a chain of the type shown, the combination with the side-bars of the links and their connecting end-bars, of removable devices, immovably seated on, or attached to, said connecting end bars, so as to receive, or sustain the frictional draft-strain between the chain and wheels over which it may be run; and removable pintles, by which the separate links of the chain are connected, in an articulated manner; all substantially as and for the purposes hereinbefore set forth.

FRANCIS LEY.

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