

No. 614,922.

Patented Nov. 29, 1898.

R. ABELL.
DRIVE CHAIN.

(Application filed Apr. 13, 1898.)

(No Model.)

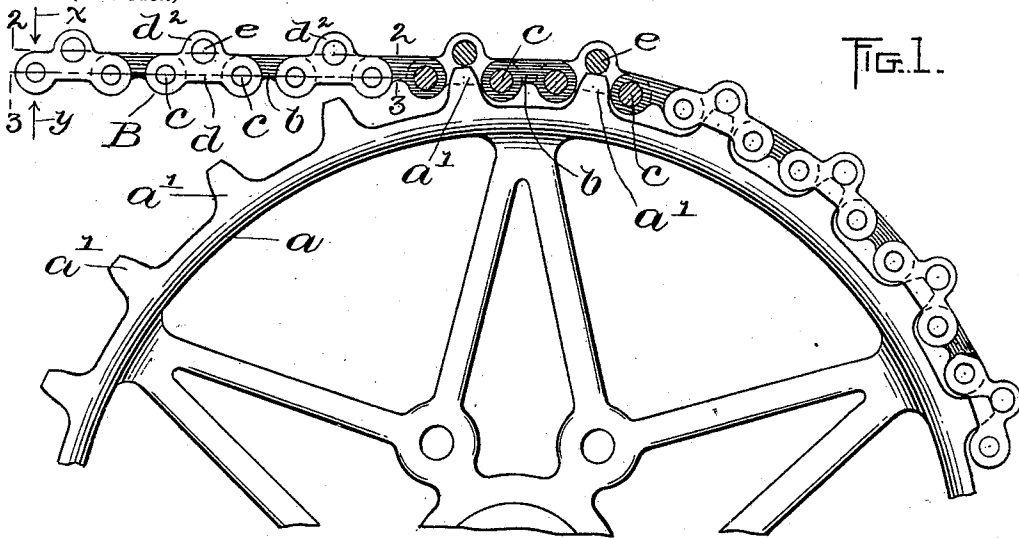


FIG. 1.

FIG. 2.

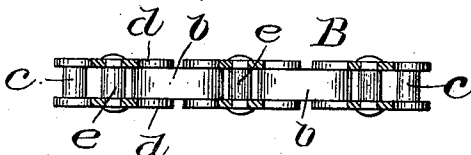


FIG. 3.

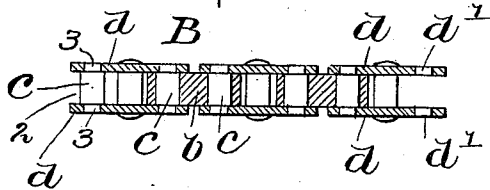


FIG. 4.

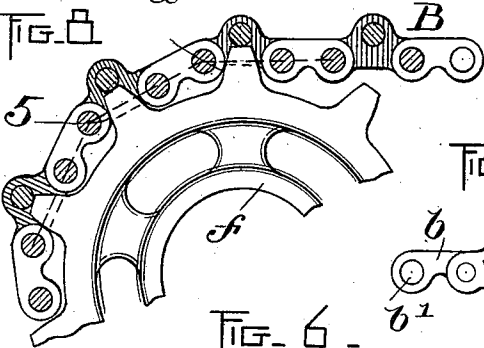


FIG. 5.

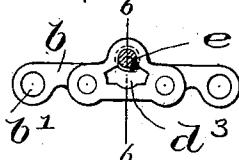


FIG. 6.

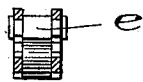
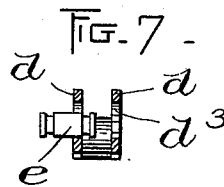
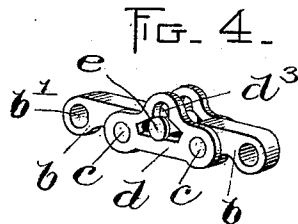


FIG. 7.



WITNESSES
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DRIVE-CHAIN.

SPECIFICATION forming part of Letters Patent No. 614,922, dated November 29, 1898.

Application filed April 13, 1898. Serial No. 677,402. (No model.)

To all whom it may concern:

Be it known that I, ROLLIN ABELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Drive-Chains, of which the following is a specification.

This invention relates to drive-chains for bicycles and other machinery; and it consists in those features of novelty in construction and arrangement which I shall now proceed to describe and claim.

Of the drawings accompanying and forming a part of this specification, Figure 1 represents a view in side elevation and section, showing part of a sprocket-wheel and a chain thereon constructed in accordance with my invention. Fig. 2 represents a section on the line 2 2 of Fig. 1, looking in the direction of the arrow *x*. Fig. 3 represents a section on the line 3 3 of Fig. 1, looking in the direction of the arrow *y*. Figs. 4 to 7, inclusive, represent detail views in perspective, elevation, section, and plan, showing my invention embodied in a separable chain. Fig. 8 is a view showing the operation of the chain when under tension on a sprocket-wheel, such as the rear sprocket-wheel of a bicycle.

The same reference characters indicate the same parts in all the figures.

In carrying out my invention as illustrated in Figs. 1 to 7, inclusive, I depart from the common construction of bicycle-chains in which the bearing-pins extending through the apertures in the blocks are employed as rivet-pins to hold the side links in place and provide instead third pins connecting the side links at points between adjacent blocks and acting as rivet-pins. These third pins rest on the tops of the sprocket-wheel teeth, preventing the blocks from bottoming between the teeth, as will be hereinafter more fully set forth. The construction also permits of the use of hardened bearing-pins.

In the drawings, *a* may represent the forward sprocket-wheel of a bicycle, having teeth or sprockets *a' a'* of the normal size.

B represents a portion of a chain, in which *b b* are blocks of ordinary formation, having apertures *b' b'* at either end for the reception of bearing-pins *c c*. The latter are formed with enlarged middle portions 2, occupying the apertures in the blocks, and reduced end

portions 3 3, occupying apertures *d' d'* in the side links or plates *d d*. These bearing-pins instead of being upset or headed outside of the blocks, as usual, merely have their reduced portions passed through the side links, making a tight fit, and the ends of the pins are preferably flush with the outside of the links, Fig. 3.

e e are rivet-pins connecting opposite side links between the blocks, the said pins being shouldered and upset or headed outside of the links (see Fig. 2) after being assembled. The bearing-pins *c c* are given their final form before being put in the chain and may therefore be hardened to reduce wear.

To accommodate the rivet-pins *e e*, the side links *d d* are formed with ears *d² d²*, projecting above the blocks, and said rivet-pins are preferably located at such a distance above the pitch-line of the chain that they will rest or sit on the convex tops or crests of the teeth and equidistant from both the next adjacent teeth in both front and rear sprocket-wheels, and also prevent the blocks *b b* from bottoming between the sprocket-wheel teeth. This is an important consideration in reducing friction, for when a driving tension is put on a chain of the ordinary construction a block in passing onto a tooth tends to grind against the base of the tooth, thus producing friction, and when mud or dirt is thrown into the sprocket or chain the friction is greatly increased. In my improved chain the grinding of the blocks against the teeth is largely done away with and there is very little increase of friction due to mud or dirt, for the dirt is given a chance to work out between the blocks and the bases of the teeth.

The present invention also provides a chain having a "straight-line" pull. This may be understood by referring to Fig. 8. 4 and 5 are two successive or contiguous points at which the power of the chain is applied to the rear sprocket-wheel *f*. Since the chain in action is pulling on itself, each link drawing on the following one, it has a tendency to straighten between these two points. This tendency is resisted in a chain of the ordinary construction by reason of the blocks bottoming against the sprocket-wheel between the teeth; but in the present construction each link is pivoted or adapted to rock on top of a tooth, and the

chain is thereby permitted to assume a number of straight-line segments on the sprocket-wheel, each segment embracing three contiguous bearing-pins *c*, as illustrated in Fig. 8.

5 Figs. 4 to 7, inclusive, illustrate a modification of my invention. This form differs from the one above described in the employment of removable locking-pins *e*, connecting the side links *d d*. The latter are formed with buttonhole-slots *d³ d³*, through the lower or enlarged portions of which the pins may be introduced or removed at any time. The upper or narrower portions of the slots are preferably parallel-sided and the pins are permanently grooved at both ends to form neck portions, which occupy the upper or narrower portions of the slots *d³* and are held therein by friction. When the chain is in action, the only tendency of the sprockets is to force the pins farther up into their slots, and by making said pins fit tightly they will have no tendency to fall out of place. By constructing the chain in this manner all of the parts may be readily assembled and removed without the use of special tools and without mutilation. The chain, as will be seen, may be easily shortened or lengthened by the removal or addition of links and may be quickly repaired in case of breakage on the road.

I claim—

1. The combination with a sprocket-wheel having its teeth of the usual form, of a chain certain parts or members whereof are centrally provided with rivet-pins which when the chain is in operative action rest on the tops or crests of said teeth, substantially as shown and described.

2. In combination with a sprocket-wheel of usual form, of a chain parts whereof are centrally provided with rivet-pins which when the chain is in action rest on the crests or tops of the teeth of said wheel, and blocks of the chain hanging between said teeth, all substantially as shown and described.

3. A drive-chain comprising apertured blocks, apertured side links, bearing-pins occupying the apertures in the blocks and side

links, and rivet-pins central of and connecting the side links between the blocks, the blocks lodging or hanging in the spaces between the teeth of a wheel, substantially as shown and described.

4. A drive-chain comprising apertured blocks, apertured side links, bearing-pins occupying the apertures in the blocks and side links, and rivet-pins central of and connecting the side links between the blocks and adapted to rest on the tops of sprocket-teeth, and equidistant from the next adjacent teeth.

5. In combination with a sprocket-wheel, a drive-chain comprising apertured blocks, apertured side links, bearing-pins occupying the apertures in the blocks and side links, and rivet-pins connecting the side links between the blocks, and resting on the tops of the sprocket-teeth, and equidistant from the next adjacent teeth.

6. The combination with an ordinary sprocket-wheel and with the teeth or sprockets thereof, of a chain composed of blocks or parts which are lodged between the teeth and have an endwise driving-bearing on the sides of the teeth, and of other parts which have a transverse supporting-bearing directly on the tops or crests of the teeth.

7. A separable drive-chain comprising apertured blocks, apertured and slotted side links, bearing-pins occupying the apertures in the blocks and side links, and annularly-grooved locking-pins occupying the slots in the side links and connecting said side links at points between the blocks.

8. A separable drive-chain comprising apertured blocks, apertured and slotted side links, headless bearing-pins occupying the apertures in the blocks and side links, and removable grooved locking-pins occupying the slots in the side links and connecting said side links at points between the blocks.

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

ROLLIN ABELL.

Witnesses:

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C. F. BROWN.