

(Model.)

2 Sheets—Sheet 1.

H. H. DOUBLEDAY.
DRIVE CHAIN.

No. 304,625.

Patented Sept. 2, 1884.

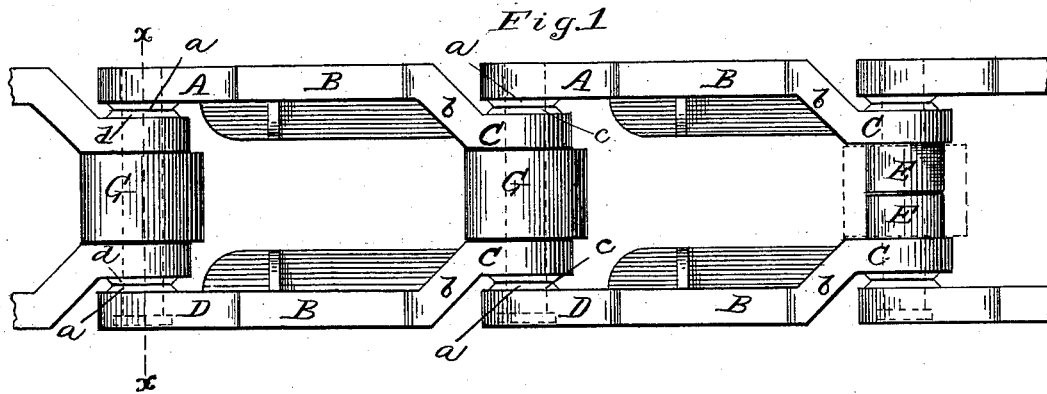


Fig. 2

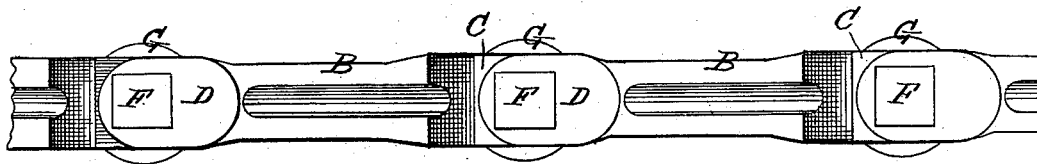


Fig. 3

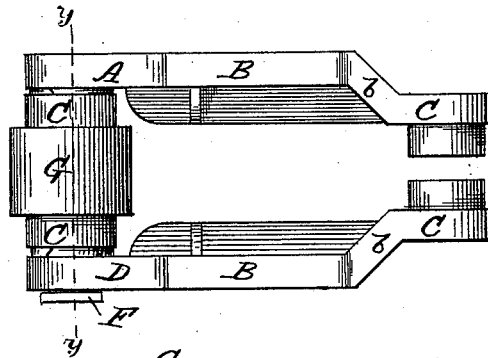
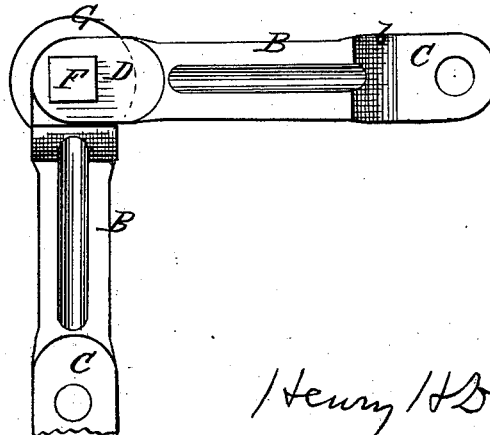


Fig. 4



Witnesses:

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Inventor:

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(Model.)

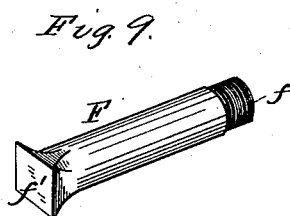
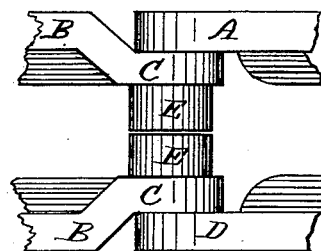
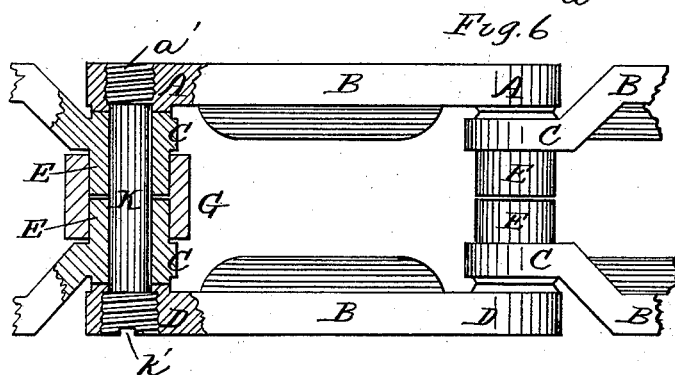
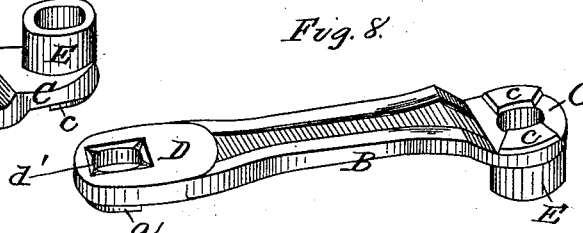
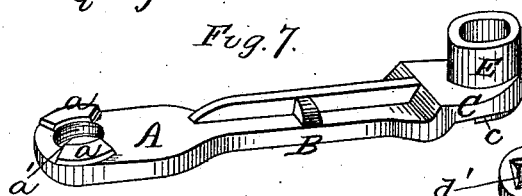
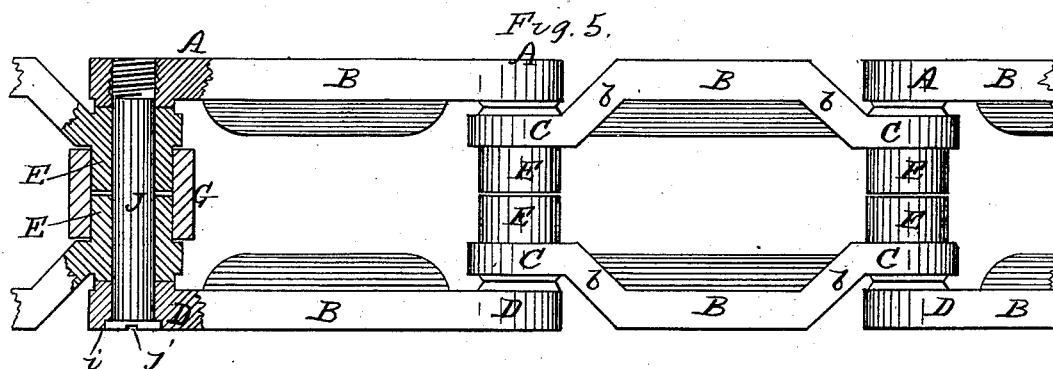
2 Sheets—Sheet 2.

H. H. DOUBLEDAY.

DRIVE CHAIN.

No. 304,625.

Patented Sept. 2, 1884.



Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

HENRY H. DOUBLEDAY, OF WASHINGTON, DISTRICT OF COLUMBIA.

DRIVE-CHAIN.

SPECIFICATION forming part of Letters Patent No. 304,625, dated September 2, 1884.

Application filed July 7, 1884. (Model.)

To all whom it may concern:

Be it known that I, HENRY H. DOUBLEDAY, a citizen of the United States, residing at Washington, District of Columbia, 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 plan view of my improved chain with the links straightened out in working position. Fig. 2 is an edge view of Fig. 1. Fig. 3 is a plan view of two links in position for removing the pintle. Fig. 4 is an edge view of Fig. 3. Fig. 5 is a plan view, partly in section, showing a modification. Fig. 6 is a plan view, partly in section, showing another modification. Figs. 7, 8, and 9 are details.

Referring to Figs. 1, 2, 3, 4, 7, 8, 9, A B C is one of the side bars, of which the part A is expanded and provided with a central screw-threaded pintle-seat, *a'*, the part B having substantially parallel edges. The part C is also expanded and provided with an inwardly-projecting sleeve-section or tubular bearing, E, and connected with the part D by an inclined section, *d*. The opposite side bar, B D C, of each pair is of substantially the same construction, except that the part D is provided with a square seat, *d'*, for the end bar, which may either proextend entirely through the side bar with converging or flaring sides, or it may consist of a circular seat having a square countersink or recess, for a purpose to be explained. Each pair of side bars in the chain is a duplicate of the other pairs of side bars.

F, Fig. 9, is the pintle having the screw-threaded end *f* and a squared head, *f'*, at its opposite end, adapted to enter and fit closely the recess or countersink *d'*.

G is an anti-friction roller mounted upon the sleeves E E. These side bars are provided with a series of riding-cams, the cams *a* *d* projecting inwardly from the ends A D of the side bars, while the cams *c* *c* project outwardly from the ends C C. By preference I make each cam to represent a segment of two, about a quarter of a circle, and locate them between the pintle-seats and the adjacent outer edges of the side bars, so that when the chain is straightened out, as in Figs. 1 and 2, the cams A D C C shall ride upon each other; but when the links are placed at right angles to

each other, as in Figs. 3 and 4, the cams will not ride upon each other, but one pair of cams will fit between the other pair of cams upon the adjacent faces of each of the side bars, the result of this arrangement and relation of parts being that when the links are in any position shown in Figs. 3 and 4, the ends A D of the side bars can be pressed inward toward the ends C C of the adjacent side bars; but when the links are in any other position than that shown in Figs. 3 and 4, the ends A D are forced outward from the adjacent ends C C by reason of the cams riding upon each other. When the links are in the position shown in Figs. 3 and 4, with the anti-friction roller mounted upon the sleeves, the pintle can be thrust through the ends of the links and screwed into its seat such a distance that when the links are straightened out, and the ends A D of the side bars thrust apart, the squared head of the pintle will be seated in the recess *d*, so that the pintle cannot be unscrewed, but will be compelled to oscillate within the sleeves E E, so that there will be practically no wear between the ends of the pintle and its seats *a* *d*; but by reason of the long bearing-surface of these sleeves, and the seats in the ends C C of the links, the chain will be very durable.

While I prefer to make each cam in the form of a segment of about ninety degrees, I do not wish to be limited thereby, as the proportions of the cams may be materially changed without altering the principle upon which they operate.

In Fig. 5 I have shown a modification of the invention having side bars C B C, which differ from the side bars A B C, in that both ends are duplicates of each other, and are formed like the ends C in Figs. 1 to 4. The side bars A B A have screw-threaded seats at their ends like the seats *a'* in the other construction. The ends D D of the other side bar of the pair have round recesses or eccentrics *i*, while the pintle J has a round flanged head provided with a slot, *j*, to receive a screw-driver.

Although in Fig. 5 I have shown the side bars as being provided with the cams, yet it is apparent that when the pintle J is used these cams may be omitted, because the pintle may be screwed into place when the links are straightened out, as indicated at the left-

hand end of this figure; but I have shown these riding cams in this figure, because I propose to use a square-headed pintle under ordinary circumstances. By examining this figure it will be seen that when square-headed pintles are used this construction possesses some advantages over that shown in Fig. 1, because in Fig. 1 the ends A D of each pair of side bars must approach each other slightly to permit the withdrawal of the pintle, and therefore there must be a little looseness between the pintle and its seats to permit this movement, whereas in the construction shown in Fig. 5 the parts may be made to fit each other with great accuracy, from the fact that when two of the links C B C are turned at right angles to one of the intermediate links having straight side bars, both ends of each of the straight side bars can be moved toward the center of the link without disturbing their parallelism with each other. Therefore the pintles may be formed to fit all of the seats with great accuracy.

In Fig. 6, at the left-hand end, I have shown another form of pintle, which is screw-threaded at both ends, which are of different diameters, the seat in each end D being of such size as to permit the smaller screw-threaded end to pass through it and be screwed into its threaded seat *d'*. This pintle K may have a slot, *k*, for the reception of a screw-driver. At the right-hand end of Fig. 6 the riding cams are omitted, showing the links as they will appear with either of the pintles J or K and without these riding cams.

I am aware that chains have been made with separable side bars, the reticulating joints of which are held together by means of screw-threaded pintles; but I do not know of any prior construction in which a threaded pintle has been utilized as one member of the reticulating joint engaging directly with and oscillating in contact with a surrounding sleeve formed upon an adjacent link or side bar.

I do not wish to be limited to the use of anti-friction rollers, it being apparent that the chain will be operative without them, because the sleeves will engage with the teeth on the sprocket-wheel. Nor do I wish to be limited to dividing the sleeves centrally, putting one half upon one side bar and the other half upon the opposite center bar of the pair, because the sleeve or sleeves upon one side might be of a length equal to the distance between the side bars, in which case the opposite side bar might be made without sleeves. Nor do I wish to be limited to making the sleeves of such length that their ends shall be in contact when the side bars are properly united with pintles to form a chain, because the anti-friction rollers may be of the proper size, and made to serve as spacing-thimbles to keep the side bars at proper distances from each other, and thus

serve as spacing-thimbles in addition to performing their function as anti-friction rollers; but I prefer to cast the spacing thimbles or sleeves integrally with one or both of the side bars in order that they shall furnish an increased wearing-surface in connection with the pintles which oscillate within them.

What I claim is—

1. In a drive-chain, the combination, with the screw-threaded pintles and the spacing-thimbles, of the separable side bars provided with seats adapted to receive the screw-threaded pintles, substantially as set forth.

2. In a drive-chain, the combination, with the screw-threaded pintles, of the separable side bars and the spacing-thimbles formed integrally with the side bars, the side bars being provided with seats adapted to receive the screw-threaded pintles, substantially as set forth.

3. In a drive-chain, the combination, with the screw-threaded pintles and the anti-friction rollers, of the side bars and the spacing-thimbles formed integrally with the side bars, the side bars being provided with seats for the screw-threaded pintles, substantially as set forth.

4. In a drive-chain, the combination of the separable side bars, the side bars on one side of the links having screw-threaded seats for the end bars, the side bars upon the opposite side of the links having the recesses *d'*, the thimbles projecting inwardly from the separable side bars, and the screw-threaded pintles having the expanded heads adapted to enter the recesses, substantially as set forth.

5. In a drive-chain, the combination of the separable side bars, the side bars on one side of the links having screw-threaded seats for the pintles, the side bars on the opposite side of the links having recesses *d'*, the inwardly-projecting sleeves, the screw-threaded pintles having the expanded heads adapted to enter the recesses, and the means, substantially as described, for locking the pintles to the side bars and preventing them from unscrewing.

6. In a drive-chain, the combination of the separable side bars, the side bars on one side of the links having screw-threaded seats, and the side bars on the opposite side of the chain having recesses *d'*, the inwardly-projecting sleeves, the screw-threaded pintles having expanded heads adapted to enter the recesses, and the anti-friction rollers, substantially as set forth.

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

HENRY H. DOUBLEDAY.

Witnesses:

BURTIS W. SOMMERS,
H. BURKE.