No. 617,716. Patented Jan. 17, 1899.

H. M. CALDWELL.

DETACHABLE CHAIN.

(Application filed Oct. 20, 1898.)

(No Model.)

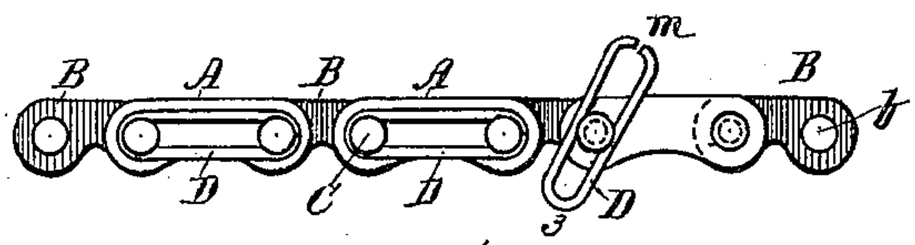

FIG. 1

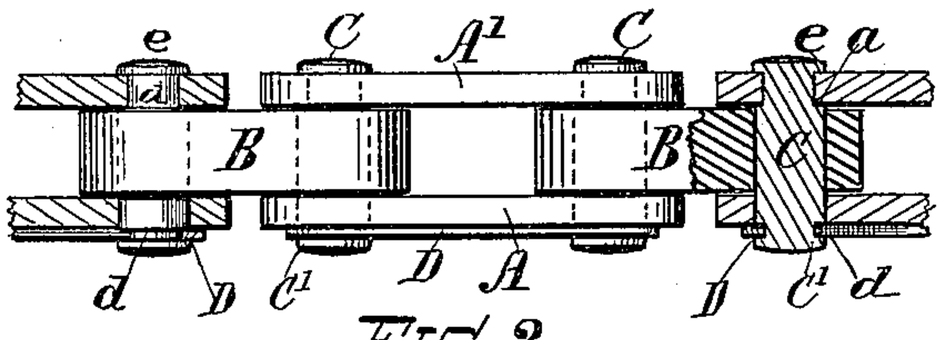

FIG. 2

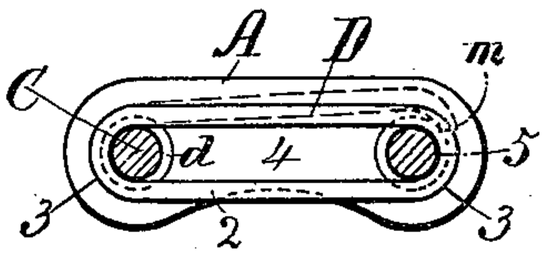

FIG. 3

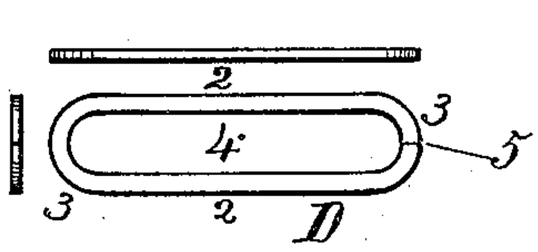

FIG. 4

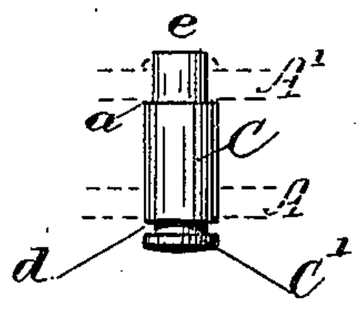

FIG. 5

Witnesses_

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UNITED STATES PATENT OFFICE.

HOMER M. CALDWELL, OF WORCESTER, MASSACHUSETTS.

DETACHABLE CHAIN.

SPECIFICATION forming part of Letters Patent No. 617,716, dated January 17, 1899.

Application filed October 20, 1898. Serial No. 694,060. (No model.)

To all whom it may concern:

Be it known that I, HOMER M. CALDWELL, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Detachable Chain for Bicycles, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention is an improvement upon the construction and means disclosed in my previous Letters Patent, No. 580,449, and relates to the peculiar structure and arrangement of the link-securing devices in the manner hereinafter explained, the objects being simplicity and practical efficiency in structure and to provide a detachable chain for bicycles which can be conveniently assembled and readily taken apart by any person without the aid of tools—a chain that is neat in appearance and which can be manufactured with facility and at comparatively small expense.

To this end my improvement consists in providing in a chain composed of block links, side link-plates, and pivot-pins of the character described a locking device consisting of a narrow oblong loop or ellipse made from watch-spring wire or flat tempered sheet metal and having semicircular end portions that embrace the grooved necks of the two pivot-pins adjacent to the exterior surface of the side link-plate, the metal at one end of said loop being severed to permit of its being sprung onto and from the grooved neck of the pivot-pins, as shown in the accompanying drawings, in which—

Figure 1 is a side view of so much of a bicycle-chain as will illustrate my invention. Fig. 2 is a top view of the links, on enlarged scale, with a portion shown in section. Fig. 3 is a sectional view through the necks of the pivot-pins. Fig. 4 shows side, edge, and end views of my elliptical locking device; and Fig. 5 is a side view of one of the pivot-pins.

In the construction of this improved chain the side link-plates A and A′ are made of flat bars or punched from sheet metal in the usual or well-known form. The center links or blocks B are also of well-known kind, with holes *b* through their ends. These links are united with the side links by pivots or hinging-pins C, that pass transversely through the openings in the blocks and side links, substantially as illustrated and as employed in my previously-noted Letters Patent. At one end the pins C are provided with a shoulder *a*, and the two pins are both firmly riveted at *e* into the side link-plate A′. At their other ends the pins are fitted with a neck or narrow circumferential groove *d*, leaving a head portion C′ beyond said groove. The position of the groove corresponds with the exterior of the side plate A, and the ends of said pivot-pins are adapted to pass through and to removably fit within the openings in said side plate-link A, as heretofore practiced.

D indicates the improved locking device, which is the essential constituent of my present invention. It consists of an oblong elliptical eye plate or loop having narrow longitudinal sides 2 and rounded or semicircular ends 3 and with an opening 4 through its central part, said loop being of a dimension that will embrace the two pivot-pins C, the rounded ends 3 engaging in their neck-grooves *d*. This locking device is preferably punched out from a plate of thin steel or equivalent sheet metal hardened and tempered or cut from flat-rolled watch-spring wire, thus forming a flat, highly-resilient, double-end loop, such as separately shown in Fig. 4.

At one end of the loop D its metal is broken or severed, as at 5, by means of suitable shearing-dies, so that the sides 2 can spring apart sufficiently to permit of the locking device being passed over the head C′ of the pins C.

In assembling the chain the pivot-pins, fixed in the side link A′, are first passed through the blocks B. The side link A is then placed in position and the locking device sprung onto the necks of the pins by spreading its severed end, as indicated at *m*, Figs. 1 and 3, first passing it onto one pin and then sliding it along and springing it onto the other, as shown, the thin flat elliptical loop lying closely adjacent to the exterior side of the plate A. When closed by the resilient action of the metal, the line of severance 5 is brought and held firmly together, so the joint-line is scarcely perceptible to the eye, and its ends offer no point or projection that would be lia-

ble to catch or interfere with the cloth when wiping off the chain. These elliptical locking devices are applied to each pair of links throughout the chain, producing at comparatively small expense a superior detachable chain that can be readily assembled in manufacture or taken apart and put together by any bicycle-rider when desired without tools or simply by the use of his fingers and thumb-nail.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In combination with a removable side link-plate and the circumferentially-grooved pivot-pins in a bicycle-chain, the described link-retainer or locking device, consisting of an oblong or elliptical loop formed of thin flat spring metal, having semicircular end portions adapted for engaging the necks of two pivot-pins, said loop severed at one end to permit the spreading of its side portions and resilient closure thereof, for the purpose set forth.

2. A detachable chain for bicycles, comprising the center link-blocks, the side link-plates, and connecting pivot-pins, said pivot-pins permanently secured in one of the side link-plates, and having circumferential grooves around their opposite ends; and a link-locking device for each pair of links, said device consisting of an oblong open-centered loop formed of resilient metal, and having rounded ends, broken or severed at one end, said loop embracing the two pivot-pins and sprung into their grooves at the exterior of the removable side link-plate, as hereinbefore set forth.

Witness my hand this 18th day of October, 1898.

HOMER M. CALDWELL.

Witnesses:

CHAS. H. BURLEIGH,

CHARLES M. HARRINGTON.