

(Model.)

F. M. LECHNER.

CHAIN.

No. 261,821.

Patented July 25, 1882.

Fig. 1.

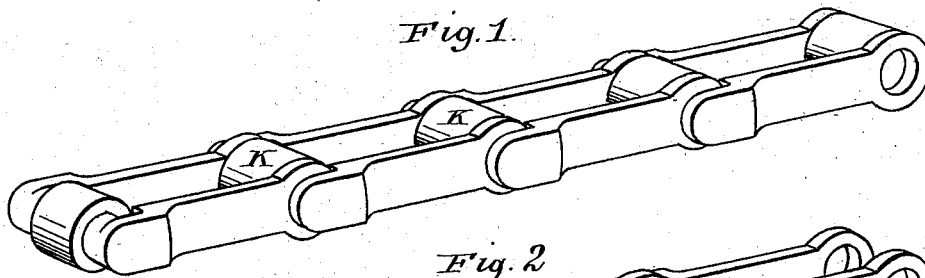


Fig. 2.

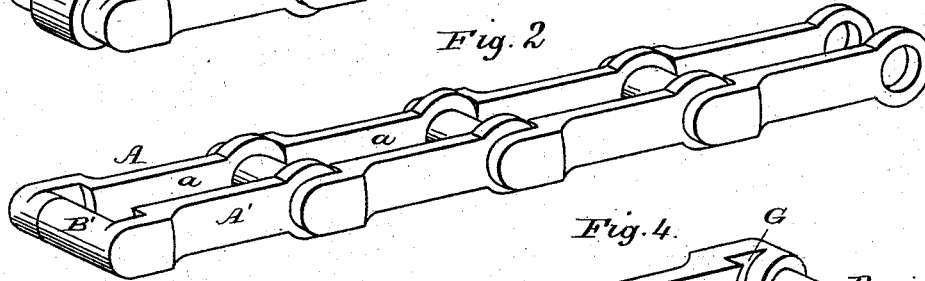


Fig. 3.

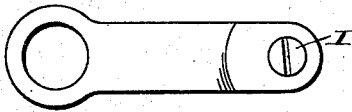


Fig. 4.

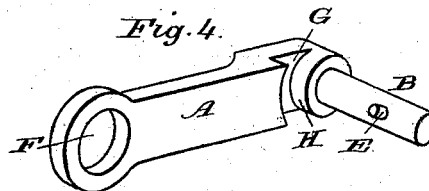


Fig. 5.

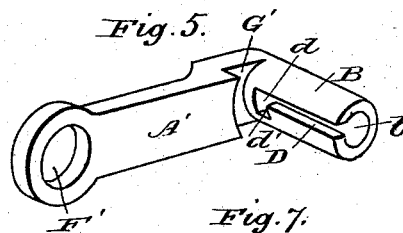


Fig. 7.

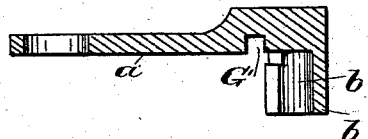


Fig. 8.

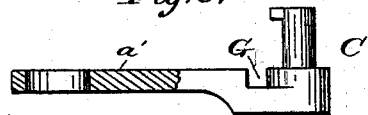


Fig. 9.

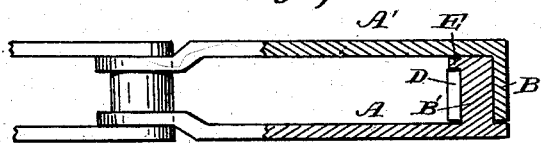
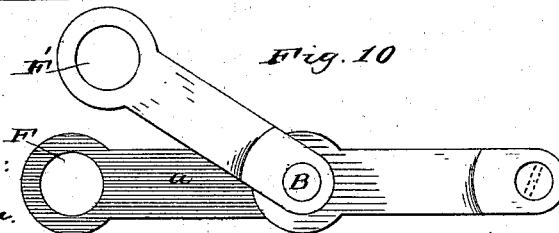


Fig. 10.



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by Doubleday and Bliss

UNITED STATES PATENT OFFICE.

FRANCIS M. LECHNER, OF COLUMBUS, OHIO, ASSIGNOR TO THE LECHNER MINING MACHINE COMPANY, OF SAME PLACE.

CHAIN.

SPECIFICATION forming part of Letters Patent No. 261,821, dated July 25, 1882.

Application filed January 19, 1882. (Model.)

To all whom it may concern:

Be it known that I, FRANCIS M. LECHNER, a citizen of the United States of America, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Chains; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a top view of a sufficient portion of a chain to illustrate my improvement; Fig. 2 is a similar view, showing the chains without anti-friction rollers. Fig. 3 is a side elevation of the last link in the series. Fig. 4 is a perspective of one of the bars or parts of a link. Fig. 5 is a perspective of an opposite bar or part. Figs. 7, 8, and 9 show modified forms of the side bars for the links, and Fig. 10 shows the position occupied by the side bars while being disengaged or engaged.

This invention relates to an improved two-part link for drive-chains whose parts are adapted to be engaged in such manner as to permit an anti-friction roller to be mounted upon the parts which join together the side bars of the link. The two side bars are formed separately from each other, and are united by a hinge-connection so constructed that the axis of said hinge-connection shall be also the axis of the anti-friction roller of the link. Said axis is perpendicular to both of the side bars, so that they can oscillate relatively to each other while the roller is in place. With each of the side bars there is permanently connected one portion of a lock, the two parts of the lock being caused to engage with each other by rocking the side bars on the axis of the roller. The two parts of the lock engage with each other when the side bars are both in the planes of their working position, but can be disengaged when said parts are in planes other than the last said planes.

In the drawings, I have shown one of the styles of link embodying my invention.

A represents one of the side bars, and A' the other. As shown in the drawings, the

side bar A' is formed with the end bar, B', said end bar serving not only as the means for transmitting the draft to or from the sprocket-wheel, but also as a bearing for an anti-friction roller, K, and, further, to provide one part of a hinge-connection with the bar A, and to carry one part of a lock.

In the construction in Fig. 4 the side bar A is provided with a laterally-projecting pin, B, which can enter longitudinally an aperture, b, in the bar B', to act as a part of a hinge-connection, and which carries the other part of the lock for securing the side bars together when in working position, this pin B in this case being of such length as to pass through the side bar A'. Its passing entirely through is not necessary, as the opening b in the bar B' may be of the nature of a socket, passing but a portion of the way through said bar B' longitudinally, as shown in Fig. 7, and the pin B may be shortened so that it shall reach only the inner end of said socket.

It will be seen that when the parts of the link are constructed and arranged thus the side bars will have a hinge-connection the axis of which is on a line transverse to the side bars, so that they can be oscillated or rocked relatively to each other. A hinge-connection of this character between the side bars is adapted to receive an anti-friction roller, as shown in Fig. 1, the connecting device passing into or out from the roller on straight lines, so that the aperture in the roller need not be any larger than is necessary to allow it to work freely upon the bearing which is provided for it by the hinging parts.

When the side bars and the end bar are in working position—that is to say, when they are in substantially the same plane transversely across the link—they are fastened together by a lock, one part of which is connected with and carried by the side bar A, and the other part engaging therewith is connected with and carried by the side bar A', the two parts of the lock preventing lateral displacement. The bars may be unlocked by swinging one or both of them relatively to each other on the axis of the aforesaid hinge-connection through an arc great enough to carry the locking parts out of engagement.

The axis about which the parts of the lock move as they are brought into or out from engagement is the axis of the anti-friction roller.

In the drawings that part of the lock carried by the bar A is represented by E, it being connected in the construction shown with the side bar by means of the pin B, and that part of it carried by the bar A' is represented by d', it consisting of a shoulder formed on the end bar, B', said bar connecting it with the side bar. Preferably the part E is of the form of a pin or stud, adapted to be passed inward through a slot, D, when the side bars are caused to approach each other laterally until it (said part E of the lock) gets behind the other part at d'. This latter is formed in the construction shown by making a recess, d, in the wall of the socket in end piece, B', which recess communicates both with the socket b and with the slot D.

The engaging stud or pin E is represented as being situated near the outer end of the pin B; but the exact position shown is not essential to the invention, as the same results can be obtained if its position be somewhat varied, as will readily be seen. After the pin B has been thrust in sufficiently far to carry the pin or stud E into the recess d it is made to engage with the shoulder d' by rotating the pin B a little relatively to the end bar, B'. After being thus made to engage with said shoulder d' the pin B cannot be withdrawn from the end bar, B', and therefore the two parts of the link are locked together. The slot D is situated above the central longitudinal plane of the link, and the pin or stud E is situated in another plane relatively to the central one of the link. When the two parts of the link are being joined or separated they are in the positions relatively to each other shown in Fig. 10. When the two parts are locked together they are then in the same planes and are in working position.

At the opposite ends the side bars, A A', are provided with eyes F F', with an inner diameter substantially the same as that of the end bar, B', so that said eyes can be made to engage with the end bar, B', of the succeeding link. They may be so arranged as to engage with said end bar, B', either inside of the planes of the inner faces of the side bars, A A', as shown in Fig. 9, or flush with said faces, as shown in Fig. 2.

The parts shown detached in Figs. 4, 5, 7, and 8 are arranged to have the eyes F F' of one link flush with the inner faces, a a', of a succeeding link. G G' are recesses formed in each side bar, the recesses being curved so as to permit the eyes F F' of the next link to turn freely therein.

H represents a cylindrical offset or shoulder upon the side bar carrying the pin B, said offset or shoulder being of substantially the same outside diameter as is the end bar, B'. This construction and arrangement of the parts necessitate an expanding outwardly of the side

parts of the link to allow for the formation of the recesses G G'. Instead of this construction, the part of the side bar which has the eye F or F' upon it may be turned inwardly, as shown in Fig. 9, and for many purposes a chain of this construction will be preferable—for instance, when one is desired the outer side of whose links shall lie in substantially unbroken lines.

When several links are joined in the manner described a chain is formed either of the character shown in Figs. 1 and 2 or that in Fig. 9.

After a chain of sufficient length has been made its ends may be joined by means of a link having side bars of substantially the same construction as those described, but not having the pin or stud E, having in place thereof a screw, I, passing through the side bar which has the end bar, B', and engaging with the outer end of the pin B, as shown in Fig. 6.

I am aware of the fact that use has for a long time been made of drive-chains each link of which has two side bars constructed separately and so joined at one end, or both ends, that they can be oscillated (at either end when disconnected at the other) relatively to each other about a common pivot, said pivot consisting of a piece or pieces of metal separate from the side bars; but I am not aware that links have been made with side bars having at the end a hinge-connection consisting of inwardly-projecting metallic parts formed integrally with the side bars and engaging directly with each other, the axis of the hinge being on lines substantially at right angles to the side bars, and having combined with the hinge a lock to prevent lateral movement while the bars are in one position relative to each other, and to permit such movement while in another position.

I am also aware that use has been heretofore made of chain links, each of which was constructed of two pieces, said pieces being the side bars, with inwardly-projecting parts at the ends of said bars, one of the inwardly-projecting parts having a curved socket, and the other being a curved bar adapted to slide into said curved socket when the two parts of the link were in the plane which they occupy while in working position; but the chains having links of this construction are so arranged that it is impossible to remove a link therefrom without turning said link, as a whole, backward upon or into close proximity with the adjacent link to permit the side bars to be detached from each other. Moreover, this last-described construction of link has been such that it is impossible to join an anti-friction roller thereto by passing into it on straight lines (parallel with the axis of the roller) the parts which are to provide its bearing.

I am further aware that use has heretofore been made of links the side bars of which have inwardly-projecting lugs at the ends to engage with a third piece, both of the opposing lugs on the side bars being similar in shape. The part which connects the two side bars (in the

construction now referred to) forms the adjacent link, and is not adapted to engage with a sprocket-tooth. With links of this character, also, it is impossible to combine an anti-friction roller in the manner which can be followed in making my chain.

I do not in this case claim anything except what is specifically set forth in the following claims, reserving the right to claim all other patentable features in another application which I am about to file.

What I claim is—

1. A chain-link the side bars of which are detachably connected together at one end by lateral projections which are formed integrally with the side bars, and which engage directly with each other to form a hinge having an axis perpendicular to the side bars, and locking devices connected permanently with and carried by the side bars, and arranged to be carried into and out of engagement by the side bars when they move around said axis, in combination with an anti-friction roller adapted to be mounted on the hinge-connection between the side bars provided as aforesaid, substantially as set forth.

2. A chain-link constructed with the side bar A, the side bar A', and the end bar B', formed integrally with the side bar A' and perpendicular thereto, means formed integrally with the side bar A for detachably connecting said end bar to side bar A, and arranged to move into and out of engagement with end bar B', on straight lines, and locking devices connected permanently with the side bars, and carried into and out of engagement when the side bars are rocked relatively to each other in

different but parallel planes, whereby the link is adapted to have an anti-friction roller passed longitudinally onto said end bar B', and to lock said roller in position when the side bars are oscillated, substantially as set forth.

3. The side bar A, with the end bar B, and projection E, in combination with the side bar A', having the laterally-projecting bar B', provided with the socket *b*, slot D, and the stop *d'*.

4. The side bar A', with the socketed or hollow end bar B', provided with a slot, D, and with the recess *d*, communicating with the slot D and with the socket, in combination with the side bar A, having the end bar B, and the projection E, adapted to pass through the slot D into the recess *d*, substantially as set forth.

5. The side bar A', having at one end the eye F' and at the other end the laterally-projecting end bar B', formed integrally with the side bar A', and provided with a socket formed on straight lines transverse to the side bar, in combination with the opposite side bar, A, having the eye F at one end and the laterally-projecting bar B at the other end, formed on straight lines transverse to the side bar, and adapted to slide longitudinally into the end bar B', and means, substantially as described, for locking the two side bars together when they are in the same plane.

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

FRANCIS M. LECHNER.

Witnesses:

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B. W. NEEREAMER.