

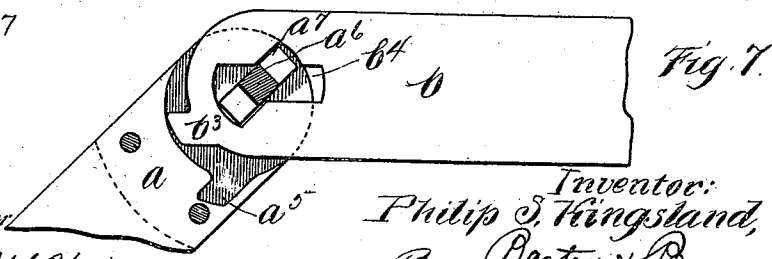
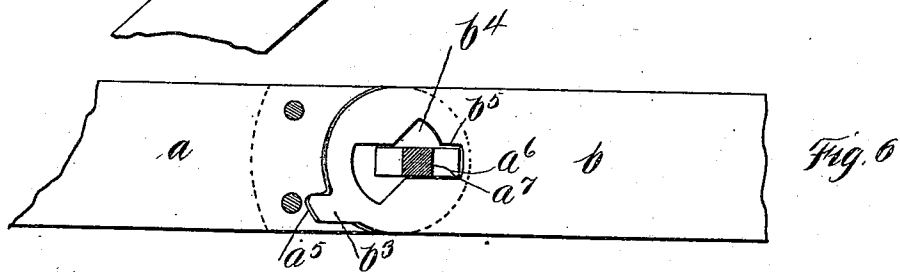
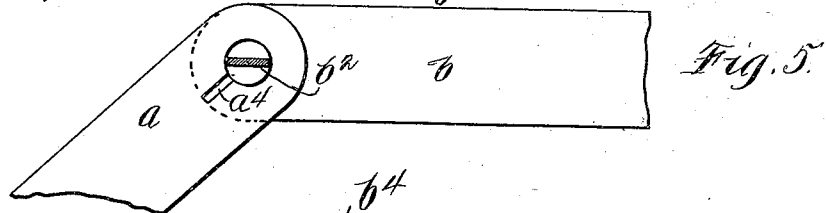
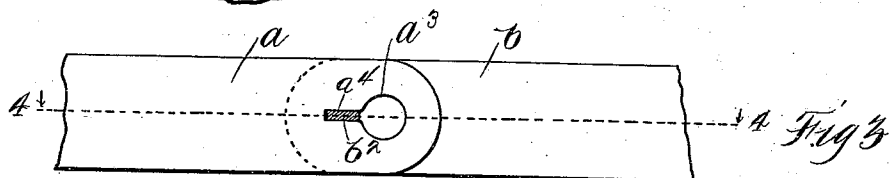
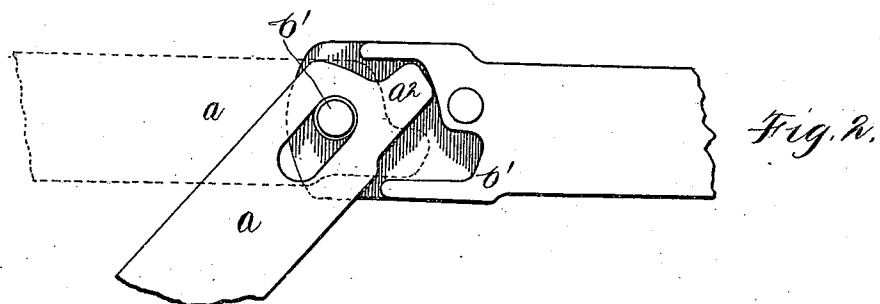
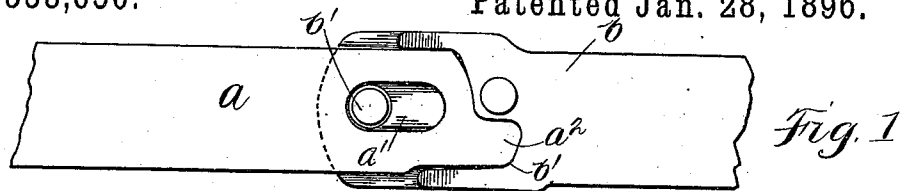
(No Model.)

2 Sheets—Sheet 1.

P. S. KINGSLAND.
LOCK CHAIN.

No. 553,650.

Patented Jan. 28, 1896.



Witnesses:
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W. Clyde Jones.

Inventor:
Philip S. Kingsland,
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Attorneys.

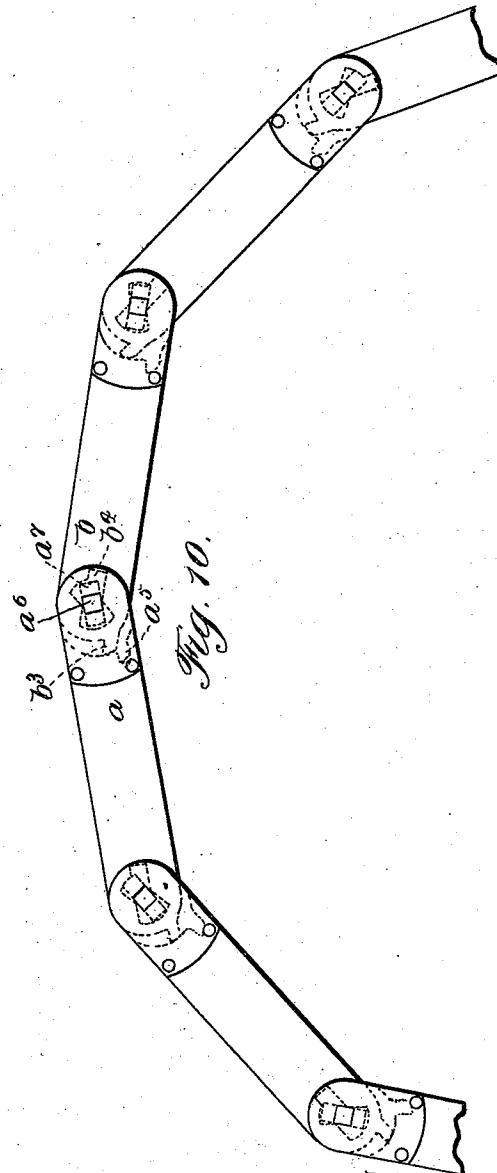
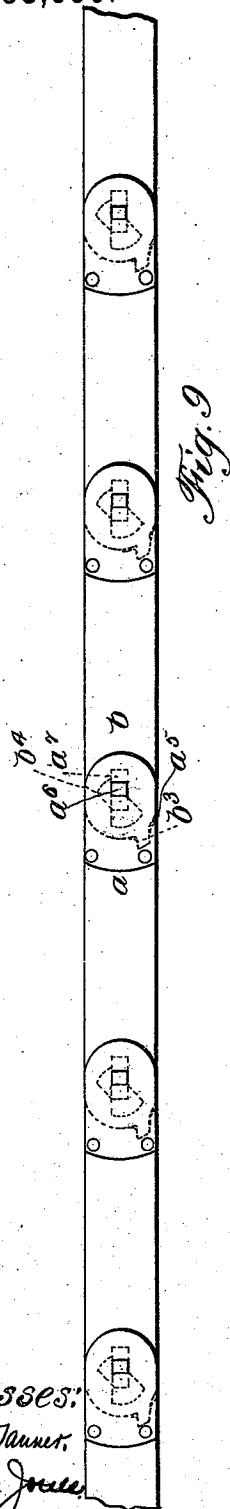
(No Model.)

2 Sheets—Sheet 2.

P. S. KINGSLAND.
LOCK CHAIN.

No. 553,650.

Patented Jan. 28, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

PHILIP S. KINGSLAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE KINGS-
LAND FLUE SCRAPER COMPANY, OF SAME PLACE.

LOCK-CHAIN.

SPECIFICATION forming part of Letters Patent No. 553,650, dated January 28, 1896.

Application filed July 27, 1895. Serial No. 557,337. (No model.)

To all whom it may concern:

Be it known that I, PHILIP S. KINGSLAND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Lock-Chains, (Case No. 7,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a lock-chain, my object being to provide a chain which may be rendered either flexible or rigid, as may be desired. It is often desirable to employ a chain which may be wound about a drum or otherwise folded into small space, while at the same time being capable of being rendered rigid, whereby a longitudinal thrust may be imparted thereby. In Letters Patent No. 514,195, granted February 6, 1894, to Christian C. Hill and myself, is described a boiler-flue-cleaning mechanism in which the flue-scraper is thrust into the flue and withdrawn therefrom by means of a chain composed of balls, the balls being of such a size that the chain cannot buckle within the flue when a longitudinal thrust is imposed thereon in forcing the scraper into the flue. The lock-chain of my invention herein is particularly applicable to such a machine wherein it is desired to impart a longitudinal thrust to force the scraper into the flue, while at the same time the chain is flexible, whereby it may be wound upon a drum or otherwise bent as it is withdrawn from the flue.

Other applications of my invention will suggest themselves, and I merely mention the above to indicate the utility of the device.

In accordance with my invention the chain is formed in links, the links carrying coacting projections and recesses adapted to engage when the links are thrust together to prevent the relative flexion of the links, thus rendering the chain as a whole rigid, a certain freedom of longitudinal movement being provided between the links whereby the same may be unlocked and the relative flexion of the links permitted. By this construction when the links are pressed together, as when a

thrust is imposed thereon, the chain is rendered rigid, while when the links are pulled apart, as when a longitudinal pull is exerted thereon, the chain is rendered flexible.

I will describe my invention in detail in connection with the accompanying drawings, in which—

Figure 1 is a view of two links of a chain embodying my invention, the links being thrust together, whereby they are locked against rotation. Fig. 2 is a similar view showing one of the links rotated relatively to the other. Fig. 3 is a plan view of a modification, showing the links locked together. Fig. 4 is a sectional view on line 4 4, Fig. 3. Fig. 5 is a view showing the links relatively rotated. Fig. 6 is a view of a further modification, the links being locked together. Fig. 7 is a similar view showing the links relatively rotated. Fig. 8 is a detail view of the locking-pin employed in the construction illustrated in Figs. 6 and 7. Fig. 9 is a view of a chain constructed in accordance with my invention, the links being locked together. Fig. 10 is a view showing the chain in a flexed position.

Like letters refer to like parts in the several figures.

As illustrated in Figs. 1 and 2, the link *a* is provided with a longitudinal slot *a'*, within which a pin *b'*, carried upon the link *b*, is adapted to move. The link *a* carries a projecting end *a²* adapted when the links are thrust together to enter a recess provided in the link *b*. When in this position the two links are locked against relative rotation. When the links are drawn apart, as illustrated in Fig. 2, the links may be relatively flexed, the chain being thus rendered flexible.

In Figs. 3, 4 and 5 is illustrated a modification in which a slot is provided in the link *a* comprising a round portion *a³* and a longitudinally-extended portion *a⁴*, while upon the link *b*, which is preferably formed from two plates, is carried a flat pin *b²*, adapted when the links are thrust together to enter the portion *a⁴* of the slot and thus lock the links together. When the links are pulled apart, the

pin b^2 rests within the round portion a^3 of the slot and the links may be relatively flexed, as illustrated in Fig. 5.

In Fig. 6 I have illustrated a further modification in which the links may be cut from a single strip or band of metal without loss of material, the links being stamped out so that the projection b^3 of link b corresponds to the recess a^5 of link a . When the links are thrust together their relative flexion is prevented. The link b carries a slot b^4 , and upon the link a is mounted a locking-pin a^6 , the end a^7 of which is adapted to enter the recess b^5 when the links are thrust together. When the links are pulled apart the end a^7 is withdrawn from the recess b^5 and the projection b^3 from the recess a^5 and the links are free to be moved into an angular position, as illustrated in Fig. 7. It will be observed that in this latter modification the links are locked together by a pair of coacting projections and recesses upon each side of the axis of rotation.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lock chain, the combination with a plurality of links pivotally connected at the ends to permit the flexion of the chain, of

locking means for maintaining the links locked in alignment when the links are thrust together; substantially as described.

2. In a lock chain, the combination with a plurality of links pivotally connected at the ends to permit the flexion of the chain, of projections or tongues provided upon said links at one end, and recesses provided upon the links at the opposite ends to receive said tongues when the links are in alignment and are thrust together; substantially as described.

3. In a lock chain, the combination with a plurality of links pivoted together to permit flexion of the chain and longitudinal movement of the links relatively, of the projections b^3 provided upon said links at one end, and the recesses a^5 provided therein at the opposite ends, the locking pins a^6 , slots b^4 within which said locking pins are adapted to move, and recesses b^5 communicating with slots b^4 ; substantially as described.

In witness whereof I hereunto subscribe my name this 23d day of July, A. D. 1895.

PHILIP S. KINGSLAND.

Witnesses:

CHARLES A. BROWN,
W. CLYDE JONES.